

REPORT TO THE TWENTY-SEVENTH LEGISLATURE
REGULAR SESSION OF 2014

BUDGETARY AND OTHER ISSUES REGARDING INVASIVE SPECIES



Prepared by:

THE STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE

In response to Section 194-2, Hawaii Revised Statutes

October 2013

Table of Contents

Executive Summary	4
I. Introduction	6
II. Budgetary Issues Relating to Invasive Species	
Invasive Species Funding Needs	7
FY15 General Fund Request	10
The Cost of Inaction: Examples of High-Cost Invasive Species In Hawai'i	11
Money Made Available to the HISC	12
FY13 HISC Disbursements	13
Summary of Project Achievements Supported by FY13 HISC Funds	18
III. Advice to the Governor and Legislature Regarding Invasive Species	
FY13 Resolutions of the HISC	20
Reso. 13-1: Supporting federal recognition of Hawaii's unique biosecurity needs and coordination between federal and state inspection agencies	21
Reso. 13-2: Supporting the reauthorization of the Brown Tree Snake Control and Eradication Act of 2004	23
Reso. 13-3: Supporting amendments to the list of injurious species under the Lacey Act	25
HISC Testimony During the 2013 Legislative Session	27
IV. Hawai'i Invasive Species Council Reports	
HISC Meetings in FY13	28
Hawai'i Invasive Species Awareness Week 2013	29
Overview of the Invasive Species Problem in Hawai'i	32
V. HISC-Funded Projects: Prevention	
Goals and Key Activities in FY13	35
Hawai'i-Pacific Weed Risk Assessment	36
Ballast Water and Hull Fouling Coordinator	38
VI. HISC-Funded Projects: Control	
Goals and Key Activities in FY13	40
Hawai'i Ant Lab	41
Eradication of Little Fire Ants from Kaua'i	43
Control of Incipient Weeds in Kōke'e State Park	45
Big Island Axis Deer Eradication	47
Maui Island Axis Deer Management	50
Christmas Berry Biocontrol Evaluation	52
Technical Support of Weed Biocontrol	55
Detection and Control of Invasive Species in Kaua'i County	58
Detection and Control of Invasive Species on O'ahu Island	60
Detection and Control of Invasive Species in Maui County	62
Detection and Control of Invasive Species in Hawai'i County	64
VII. HISC-Funded Projects: Outreach	
Goals and Key Activities in FY13	66
Cultivating Invasive Species Awareness Among O'ahu's Farmers	69
Outreach for Kaua'i County	70
Outreach for O'ahu Island	72

Outreach for Maui County	75
Outreach for Hawai'i Island	77
Supporting Invasive Species Outreach Efforts	79
Appendix 1: Chapter 194, Hawaii Revised Statutes: INVASIVE SPECIES COUNCIL	81



FY13 Executive Summary

HAWAI‘I INVASIVE SPECIES COUNCIL

PROVIDING STATE POLICY DIRECTION, COORDINATION, AND PLANNING TO PROTECT HAWAI‘I FROM THE IMPACTS OF INVASIVE SPECIES.



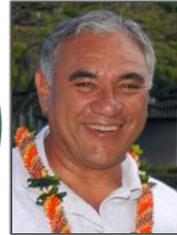
JESSE SOUKI
DBEDT



DR. MARIA GALLO
UH



RUSSELL KOKUBUN
DOA



WILLIAM AILA
DLNR



DAVID RODRIGUEZ
DOT



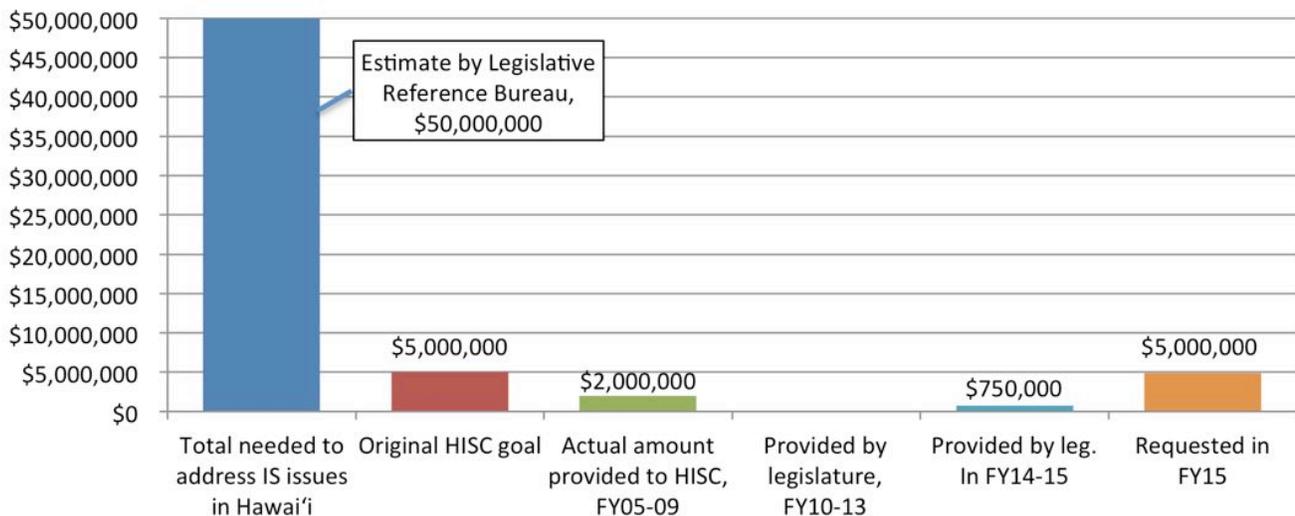
GARY GILL
DOH

BUDGETARY ISSUES

Invasive Species Funding Needs

- A Legislative Reference Bureau study in FY03 estimated the funding needed to protect Hawai‘i from invasive species at **\$50,000,000** annually.
- The original concept for the Hawai‘i Invasive Species Council (HISC) in FY04 was **\$5,000,000 annually**. However, the legislature provided **\$2,000,000** in general funds annually from FY05-09, and **\$0** in general funds thereafter.
- Due to chronic underfunding, the DLNR has supplemented these general funds with special funds from the Natural Area Reserve Fund in recognition of the importance of protecting Hawai‘i’s environment and economy.
- In 2013 the legislature denied a bill that would have added the HISC as a designated beneficiary of special funds from the Natural Area Reserve Fund and appropriated **\$750,000** in general funds for FY14-15.
- Due to the inability to obtain dedicated special funding and severely limited general funds, **the DLNR (as administrative host of the interagency HISC) is requesting a supplemental \$5,000,000 in general funds in FY15.** This is the minimum amount estimated to maintain current project capacity and avoid losing hard-won progress in invasive species prevention, control, outreach, and research.

Actual need vs provided funds, 2002-present



COUNCIL ACTIONS IN FY13

The HISC met three times in FY13 to:

- Approve a \$1.8M budget to support invasive species prevention, control, & outreach projects
- Identify policy goals relating to invasive species for the 2013 Legislative Session
- Adopt three new resolutions regarding federal invasive species issues and their impacts on Hawai'i, including reauthorization of the federal Brown Tree Snake Control and Eradication Act of 2004, updates to the Lacey Act including species of constrictor snake previously detected in Hawai'i, and the expedited removal of federal preemption in inspections of foreign and interstate commerce, which prevent Hawai'i from inspecting for state-specific threats.

Council Achievements

- The Council hosted the first Hawai'i Invasive Species Awareness Week in March of 2013, which included a proclamation by Governor Abercrombie, recognition of community heroes, and volunteer events across the state.
- Met with U.S. Congressional delegates to discuss state, federal, & regional issues relating to invasive species
- Advised the Governor and the legislature through testimonies and resolutions

HISC FUNDED PROJECTS IN FY13

Prevention Working Group

- Response to Japanese Tsunami Marine Debris and inspection for aquatic invasive species
- Established a ballast water & hull fouling program to monitor invasive species arriving in marine vessels
- Provided the only quantitative weed risk assessment tool in Hawai'i

Response & Control Working Group

- Substantial progress on the removal of Little Fire Ants from the north shore of Kauai
- A total of four axis deer now removed from Hawai'i Island
- New coordinator for the management of axis deer on Maui Island
- Response and research on Little Fire Ants from Hawai'i Ant Lab, based in Hilo
- Detection and control of incipient weeds and other pests by the Invasive Species Committees
- Evaluation of biocontrol agents for miconia, clidemia, and Christmas berry

Public Outreach Working Group

- Provided community outreach & education in all counties to raise awareness & engage the public
- Produced & aired public service announcements about little fire ant
- Reached & educated thousands of people at county fairs
- Organized volunteer trips to remove invasive species

The HISC is a cabinet-level, interdepartmental collaborative created by Chapter 194, HRS, comprised of the directors, chairpersons, or designees of DLNR, HDOA, DOH, DOT, DBEDT, and UH. For more information, visit the new HISC website at <http://hisc.hawaii.gov>, or contact HISC Support Staff:

- Joshua Atwood, DLNR Invasive Species Coordinator: Joshua.P.Atwood@hawaii.gov
- Emily Montgomery, HISC Planner: Emily.C.Montgomery@hawaii.gov

I. Introduction

Purpose of this Report

The State Legislature authorized the creation of the Hawai'i Invasive Species Council (HISC) under Act 85, Session Laws of Hawaii (SLH) 2003, and stated that "the silent invasion of Hawai'i by alien invasive species is the single greatest threat to Hawai'i's economy, natural environment, and the health and lifestyle of Hawai'i's people and visitors." The HISC is composed of the chairs or directors of five primary state departments concerned with invasive species, as well as the President of the University of Hawai'i. The HISC's purpose is to coordinate and promote invasive species prevention, control, outreach and research. Chapter 194, Hawaii Revised Statutes (HRS), establishes the interagency HISC, determines its composition and responsibilities, and gives its member agencies special abilities to enter private or public property to control invasive species (Appendix 1).



This document meets the reporting requirements of Section 194-2, HRS, and Section 28 of Act 158, SLH 2008, to annually report to the Legislature on budgetary and other issues regarding invasive species. Though the HISC is an interagency collaboration, Chapter 194, HRS, places the HISC within the Department of Land and Natural Resources (DLNR) for administrative purposes.

Composition of the Hawai'i Invasive Species Council

Chapter 194, HRS, requires that the HISC be composed of the chairs, directors, or designees of the organizations listed below. Names of council members are provided for FY13.

- | | |
|--|------------------------------------|
| • Chair, DLNR | William J. Aila |
| • Chair, Hawaii Department of Agriculture (HDOA) | Russell S. Kokubun |
| • Director, Department of Health (DOH) | Gary Gill, for Loretta J. Fuddy |
| • Director, Department of Business, Economic Development and Tourism (DBEDT) | Jesse Souki, for Richard Lim |
| • Director, Department of Transportation | David Rodriguez, for Glenn Okimoto |
| • President, University of Hawaii (UH) | Maria Gallo, for MRC Greenwood |

Additionally, non-voting participants are invited to provide advice and assistance to the HISC. In FY13, participants in the proceedings of the HISC included:

- | | |
|---|---|
| • Sen. J. Kalani English | • Rep. Derek Kawakami |
| • Sen. Clarence Nishihara | • Rep. Mark Hashem |
| • Rep. Clift Tsuji | • Loyal Mehrhoff, US Dept of the Interior |
| • Angela Kieran-Vast for Maj. Gen. Darryll Wong (Adjutant General, DOD) | |

II. Budgetary Issues Relating to Invasive Species

Invasive Species Funding Needs

Hawaii's economy and its value to residents are based in Hawai'i's unique and beautiful environment. That environment is constantly threatened by the introduction of non-native, invasive species that take over our watersheds, endanger our native plants and animals, reduce our available drinking water, and introduce new diseases to our population. In 2002, the Legislative Reference Bureau produced the report, "Filling the Gaps in the Fight Against Invasive Species," which estimated the cost of protecting our resources, economy, and way of life from invasive species at **\$50,000,000 annually**.

In 2003, the legislature formed the Hawai'i Invasive Species Council (HISC) to provide cabinet-level direction on invasive species issues. The stated original goal for an annual HISC budget to fund invasive species prevention, control, research, and outreach projects was **\$5,000,000** annually. This figure assumed that the bulk of the total need (estimated at \$50,000,000) would be covered by alternative state, county, federal, and private funding.

Instead of \$5,000,000, the legislature provided the HISC with **\$2,000,000** in its first year of funding. Due to the economic downturn in 2008, legislative funding dropped to **\$0**.

Because the mission of the HISC is so critical to the functioning of Hawai'i's environment and economy, the DLNR has stepped in to provide supplementary special funds from the Natural Area Reserve (NAR) Fund to mitigate **chronic underfunding of the HISC**. In the 2013 legislative session, the legislature failed to pass a bill allowing the HISC to become a designated recipient of NAR special funds, advocating instead for the use of general funding. The legislature provided \$750,000 in general funds for each year of the FY14-15 biennium.

Due to the lack of special funding and the increased need for invasive species funds due to historic underfunding, the **DLNR, as administrative host of the interagency HISC, is requesting a supplement of \$5,000,000** for the second half of the

State of Hawai'i Invasive Species Needs, by the numbers:

- **\$50M**: the annual amount estimated by the Legislative Reference Bureau to address invasive species in Hawai'i in FY03
- **\$5M in general funds**: the original goal of an annual HISC budget in FY04-05
- **\$2M in general funds**: the actual amount of general funds originally provided by the legislature for HISC, FY05-09
- **\$0 in general funds**: the amount provided by the legislature in general funds to the HISC from FY10 through FY13.
- **\$2-3M in special funds**: the amount provided annually by DLNR to keep the HISC afloat due to a chronic lack of general funds, FY05-13
- **\$750,000 in general funds**: the amount provided by the legislature for each year of the FY14-15 biennium.
- **\$5M in general funds**: the supplemental budget request being submitted for the HISC in FY15.

FY14-15 biennium. This is the amount calculated to simply maintain current capacity in ongoing prevention, control, research, and outreach projects in FY15.

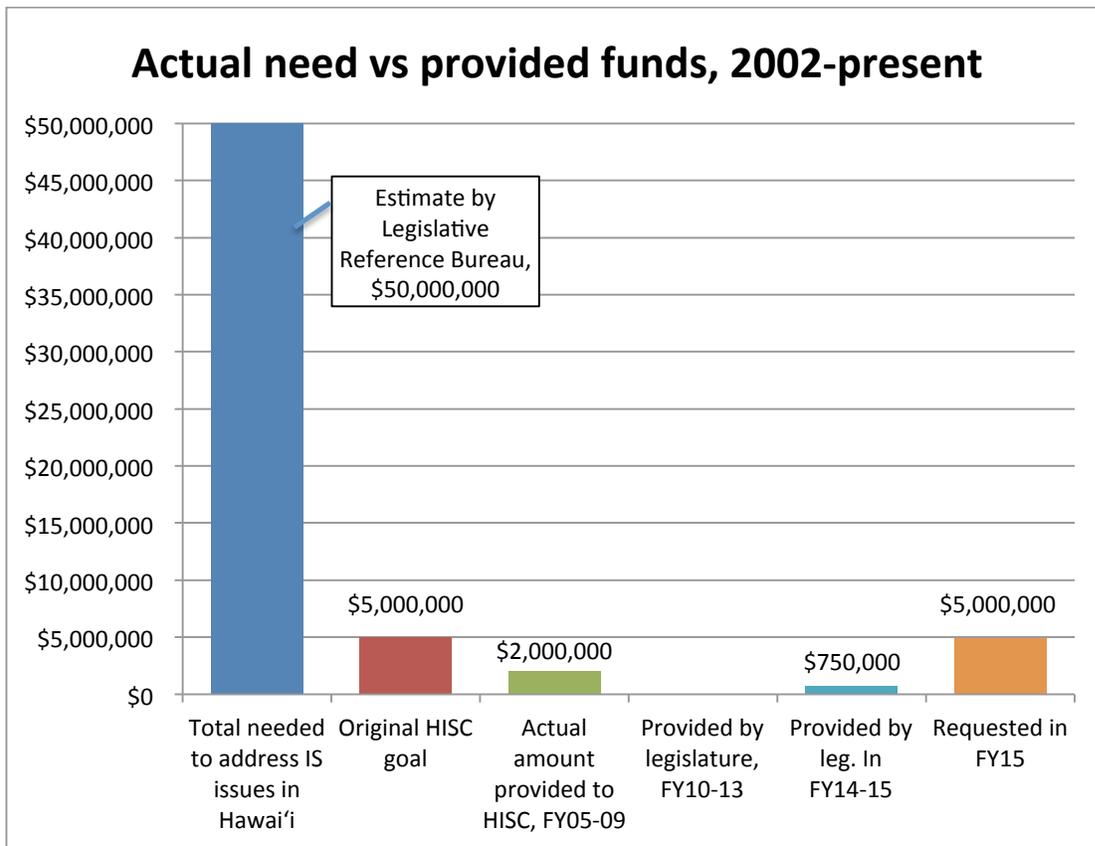
Because the HISC has been underfunded, many invasive species problems in Hawai'i have become worse over the past decade. Coqui frogs have spread across Hawai'i Island and are proving extremely difficult to eradicate on Maui. Little Fire Ants are now found throughout the greater Hilo area and in Kona, have been on Kaua'i for 10 years, and have been detected multiple times on Maui. The invasive plant miconia, known as "the green cancer," is beyond control on Hawai'i Island and is at a critical point-of-no-return on Maui and O'ahu.

The State of Hawai'i needs to reform the way it approaches invasive species management. In 2003 the legislature declared invasive species to be "**the single greatest threat to Hawai'i's economy and natural environment and to the health and lifestyle of Hawai'i's people.**" Addressing this single greatest threat should be fundamental to policy and budget actions by the legislature. The State of Hawai'i needs:

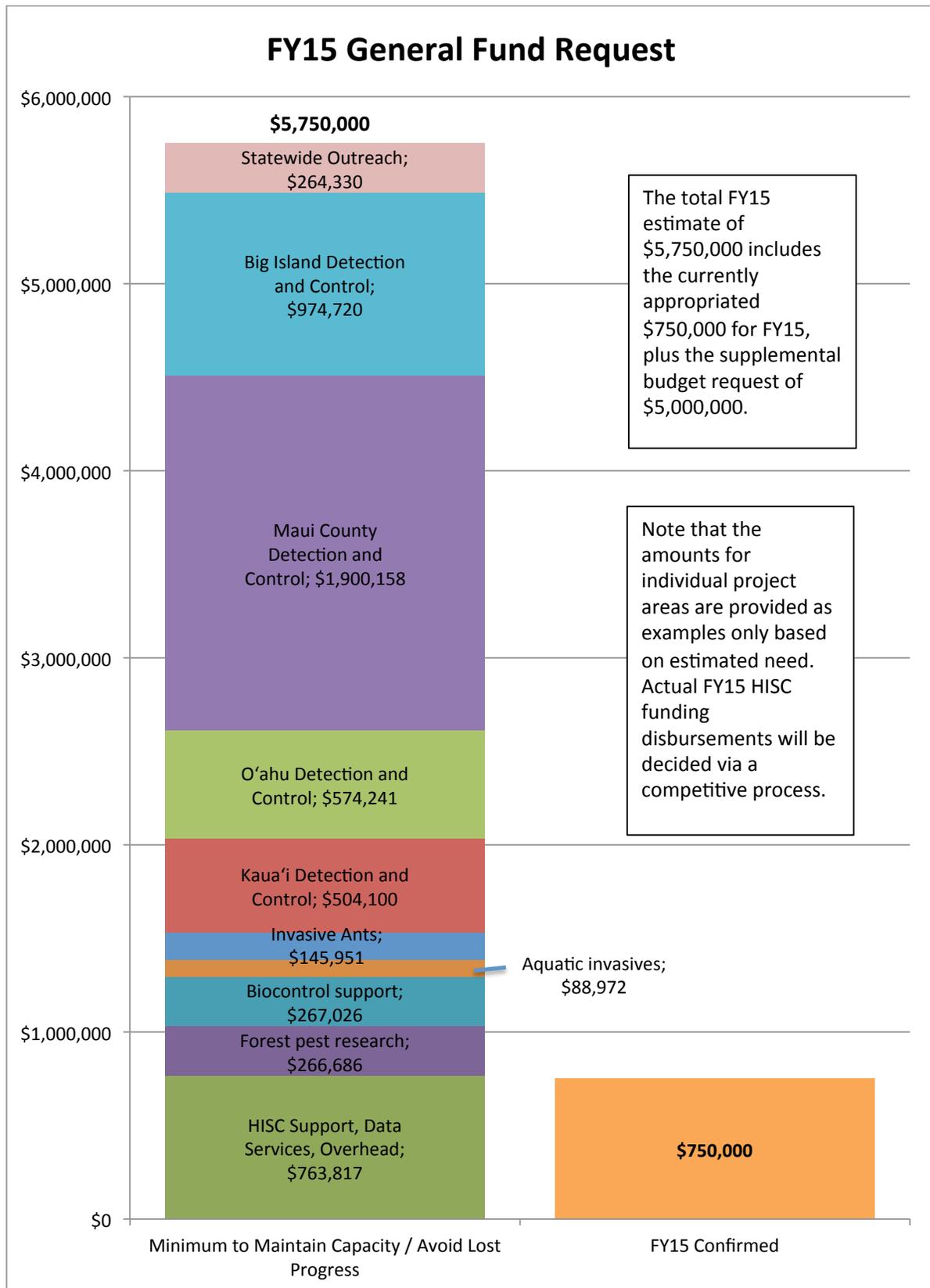
- A well-functioning, well-funded Hawai'i Invasive Species Council to create policy initiatives, collaborate across agencies, and fund critical needs in prevention, control, research, and outreach, both within and outside of priority watersheds
- New biocontrol facilities to support the most cost-effective form of invasive species control
- A vastly increased network of research, detection, and response practitioners focused on stinging ants
- Well-funded island-based Invasive Species Committees to fill the gaps between departmental mandates in early detection and rapid response to new invasive pests
- Strategic and effective

The State has a variety of additional invasive species needs that are addressed by other funding sources and are **in addition to a request for the HISC**. These include

- *The Rain Follows the Forest* watershed initiative, which focuses specifically on the protection of Hawai'i's watersheds and water production through projects such as fencing, weed removal, and ungulate removal in high-priority watersheds
- Agricultural inspection and quarantine services, provided by the Hawai'i Department of Agriculture (HDOA)
- Inspection of goods traveling interisland, provided by the HDOA
- Inspection and certification of plant nurseries as being pest free, provided by the HDOA
- Human disease vector detection and control, including mosquitos, formerly provided by the Department of Health, Vector Control Branch.



The HISC’s FY15 request of \$5.75M (including the \$750,000 currently appropriated and the supplemental request of \$5M) is the amount needed to simply maintain capacity in ongoing projects and avoid lost progress. The actual amount needed to increase capacity and achieve goals in addressing Hawai’i’s most pressing invasive species issues is much higher. In the coming year, HISC staff will work to create a comprehensive strategy outlining these most pressing issues and highlight the ways in which the HISC and other funding bodies are addressing (or failing to address) these needs. This strategy will include a much larger annual request for invasive species funding in the FY16-17 biennium budget.



The Cost of Inaction: Examples of High-Cost Invasive Species In Hawaii

Many invasive species that are not yet present in Hawai'i pose a serious threat should they arrive and become established. Species, such as the red imported fire ant, brown tree snake, West Nile Virus, avian influenza, and many others, have the potential to seriously impact the economy, natural environment, and the health and lifestyle of Hawai'i's people and visitors. The minimal cost of supporting invasive species prevention should be weighed against the often insurmountable projected costs of invasive species control if we fail to prevent species from establishing. A few notable examples:

- 1. Economic impact of Little Fire Ant: estimated at \$170,000,000 annually:** A 2013 presentation on Little Fire Ants (*Wasmannia auropunctata*) at the Hawai'i Conservation Conference by UH student Mike Motoki estimates that on Hawai'i Island alone the annual economic impact could reach \$170,000,000 in costs to nurseries, agriculture, residents, lodging, parks, schools, and other sectors. The analysis estimated that spending \$70,000,000/yr over the next 10 years could decrease these impacts. The Hawai'i Ant Lab is currently the primary resource for research and response to Little Fire Ant incursions, with an annual budget between \$200-250,000. This species has already been documented on Kaua'i and Maui, and, without proper management, will almost certainly spread throughout the State. An increased distribution of fire ants, especially in areas with high population density and high tourism value, could be devastating to Hawai'i's economy.
- 2. Economic impact of Red Imported Fire Ant: estimated at \$200,000,000 annually:** The impact of red imported fire ant alone was estimated to reach \$200 million annually within 10 years of introduction because of its impact on tourism, infrastructure and quality of life.
- 3. Economic impact of Brown Tree Snake in Hawai'i: estimated at \$2,140,000,000 annually:** A 2010 study by Schwiff et al. estimated that brown tree snake impacts could cost \$2.14 billion annually in infrastructure and health costs alone. This figure includes only the impact to electrical systems and the health care costs associated with snake bites, and does not include the cost of conservation programs to mitigate the loss of native bird species.

Investing in inspections, early detection and rapid response is critical to mitigating the potential for these costly species to establish in Hawai'i. **The restoration of HDOA inspector staff is critical** to catching invasive pests at our borders before they come into Hawai'i. With roughly half of HDOA's 95 agricultural inspectors laid off in 2009, the ability to inspect interstate and interisland shipments has been severely reduced. In FY10, the HISC provided \$600,000 to the HDOA to retain a portion of its inspection staff and capacity. In 2011, Governor Abercrombie restored 10 inspector positions at Honolulu International Airport. Additional inspection capacity will need to be provided for seaports and on islands other than O'ahu. In particular, interisland nursery and horticultural shipments leaving the Big Island have been known to carry pests such as coqui frog and little fire ant.

Funds disbursed by the HISC support detection, response, and control efforts across the State, but capacity is far less than what it needs to be to effectively protect Hawai'i. Even in situations where capacity has been built through training, funding may not exist to support a response effort. For example, there are approximately 30 people in Hawai'i who have been trained to respond to a report of a brown tree snake and assist in search efforts. Even if this capacity is maintained, the funding for equipment and staff time does not exist to adequately support a response.

An invasive species emergency fund of at least \$1,000,000 would ensure, in most incursion scenarios, an initial search and control response that could potentially save the State billions of dollars in future control and eradication costs. These emergency funds would need to be provided in addition to annual operating funds for invasive species programs.

Money Made Available to the HISC

The HISC has received general funds from the State of Hawai'i since FY05. The HISC **has no dedicated funding source**. Due to insufficient general funding, the DLNR has supplemented the HISC's general fund budget with special funds from the Natural Area Reserve Fund (NARF) and temporarily from the Legacy Land Conservation (LLC) Program.

Table 1: Total amount of funding (in millions of dollars) made available to the HISC through special and general funds, by fiscal year.

Source	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14
General Funds	\$2.0	\$2.0	\$0	\$2.0	\$1.0	\$0	\$0	\$0	\$0	\$0.75
<i>Supplemental DLNR Special Funds:</i>										
NARS S-Funds	\$1.0	\$2.0	\$2.0	\$2.0	\$3.0	\$2.0	\$1.4	\$1.4	\$1.4	\$1.8
LLC S-Funds	\$0	\$0	\$0	\$0	\$0	\$0	\$0.4	\$0.4	\$0.4	\$0
Total	\$3.0	\$4.0	\$4.0	\$4.0	\$4.0	\$2.0	\$1.8	\$1.8	\$1.8	\$2.55

General Funds: At the creation of the HISC, the targeted funding source was \$5,000,000 in general funds annually. These funds were not awarded by the legislature, which instead provided \$2,000,000 annually in FY05, FY06, and FY08, and \$1,000,000 in FY09. These funds were eliminated and \$0 in general funds were appropriated from FY10-13. Note that in FY07, the \$2,000,000 designated for invasive species work was not provided to the HISC, but was rather provided directly to Hawai'i County to support a county-lead initiative to eradicate coqui frogs. This initiative was ultimately unsuccessful. In the 2013 legislative session, \$2,000,000 was requested as part of the DLNR biennium budget for FY14-15. The legislature ultimately provided \$750,000 in general funds for the HISC for FY14 and FY15.

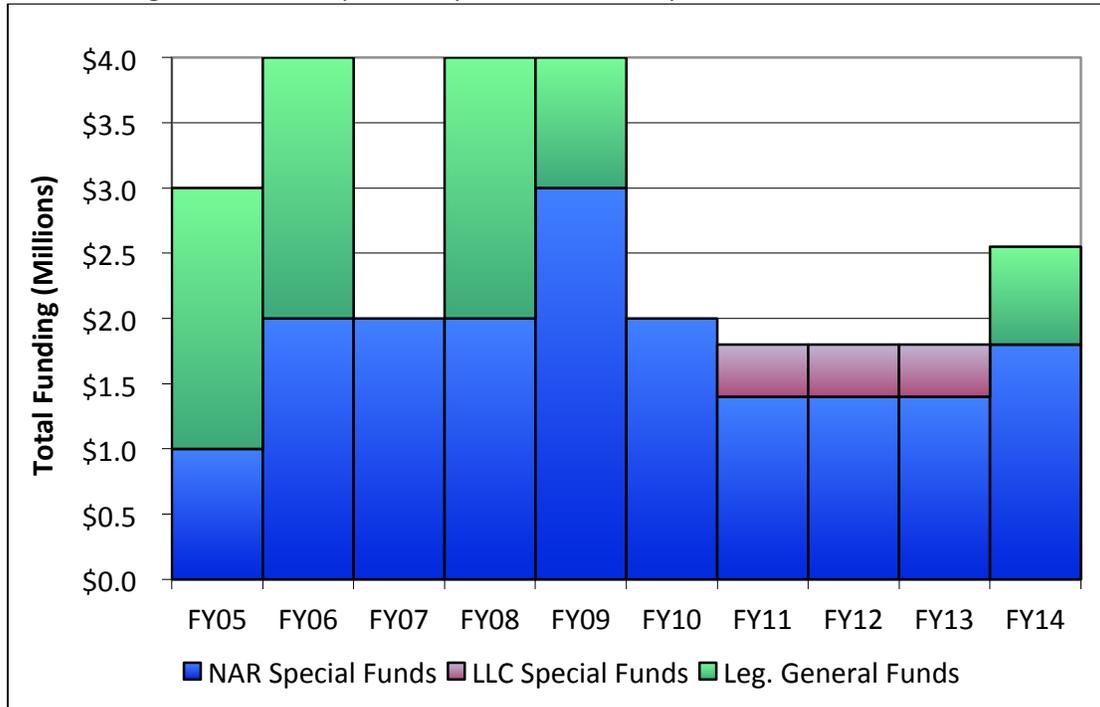
Special Funds:

Special funds have been provided by DLNR as a supplement to insufficient general funds:

- Natural Area Reserve Fund: At the discretion of the Division of Forestry and Wildlife, special funds have been provided to the HISC from the Natural Area Reserve Fund (NARF), which receives a portion of revenues from the Conveyance Tax.
- Legacy Land Conservation Program: From FY11 through FY13, a temporary authorization allowed the use of special funds from the Legacy Land Conservation Program (LLC), which also derives funding from the Conveyance Tax.

The large variance in the amount of funds available to the HISC each year has impacted the funding of projects. Due to the economic downturn in FY10, the Research and Technology Working Group ceased to offer a request for proposals and has not been funded since.

Figure 1: Funding for the HISC, separated by source and fiscal year.



FY13 HISC Disbursements

On August 3, 2012, the HISC met to approve an annual budget comprised to support projects relating to invasive species prevention, control, and outreach, totaling \$1,800,000.

Table 2: Total HISC funds separated by fiscal year and working group.

Focus Area	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13
Prevention	990,000	1,516,535	410,000	736,400	565,400	740,000	155,266	155,465	136,429
Control	1.2M	1,560,000	1,115,000	1,754,500	2,100,700	820,000	1,120,282	1,215,213	1,136,102
Research	600,000	600,000	0	700,000	500,000	0	0	0	0
Outreach	210,000	113,000	0	50,000	20,000	0	149,488	194,757	201,000
HISC Support	0	135,465	230,000	488,700	427,200	244,200	222,964	54,565	146,469
Overhead	0	75,000	245,000	270,400	386,700	195,800	152,000	180,000	180,000
Total	\$3M	\$4M	\$2M	\$4M	\$4M	\$2M	\$1.8M	\$1.8M	\$1.8M

Figure 2: Total HISC funds separated by fiscal year and working group.

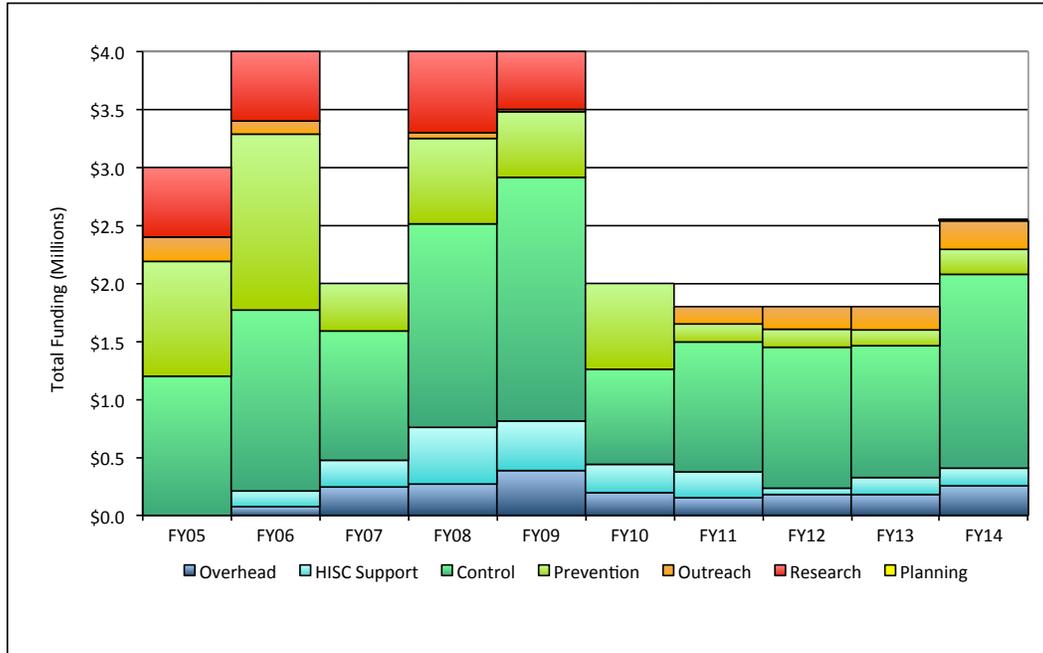


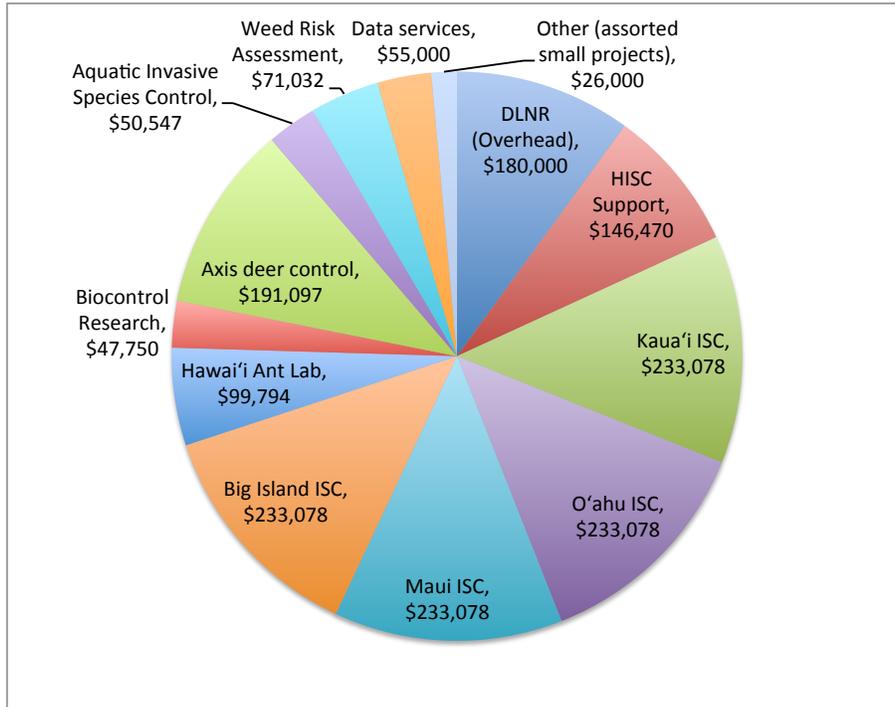
Table 3: FY13 HISC Awards

ORG	Project Title	Award
DOFAW	DOFAW Overhead (3% of \$1.8M)	54,000
DLNR	Central Services Fee (7% of \$1.8M)	126,000
HISC	HISC Coordinator and Communications Coordinator	146,470
	HISC SUPPORT / OVERHEAD TOTAL	326,470
MISC	Detection & Control of Invasive Species in Maui County	203,078
OISC	O'ahu Island Invasive Species Detection and Control	203,078
HAL	HAL Core Funding	50,475
KISC	Kaua'i Island Invasive Species Detection and Control	203,078
HAL	HAL Kaua'i Little Fire Ants	14,469
USFS	Evaluating an insect agent for biological control of Christmas berry (<i>Schinus terebinthifolius</i>) in Hawai'i	25,000
BIISC	Invasive Species Detection & Control on the Island of Hawaii	203,078
BIISC	Big Island Deer Project	118,306

*II. Budgetary Issues Relating to Invasive Species
FY13 HISC Disbursements*

USFS	Technical support of weed biocontrol research in Volcano, Hawai'i	22,750
MADWG	Management of Axis Deer on Maui Island	72,790
KRCP	KRCP Watershed Incipients	20,000
	CONTROL TOTAL	1,136,102
KISC	Public Outreach and Education in Kaua'i County	30,000
OISC	O'ahu Island Invasive Species Public Education and Outreach	30,000
HEAR	The HEAR Project	15,000
MISC	Public Outreach and Education in Maui County	30,000
BIISC	Invasive Species Education and Outreach on Hawai'i Island	30,000
HBIN	Supporting Invasive Species Outreach Efforts: Consolidated Online Public Pest Reporting, Improved Interagency Communication & Enhanced Web Content	40,000
Hon. County	Cultivating Invasive Species Awareness among Farmers	5,000
CCH	E Huli! Hawaiian Islands Ungulate Report (Project did not proceed)	1,000
DAR	Aquatic Invasive Species Outreach	20,000
	OUTREACH TOTAL	201,000
DAR	Ballast Water / Hull Fouling Coordinator	30,547
HAL	HAL Core Funding	34,851
HPWRA	Continued Support of the Hawai'i-Pacific Weed Risk Assessment	71,032
	PREVENTION TOTAL	136,429
GRAND TOTAL		1,800,000

Figure 3: FY13 HISC Awards



Other Invasive Species Funding Disbursed by DLNR

HISC awards are disbursed by the Division of Forestry and Wildlife (DOFAW) at (DLNR). In FY13, a number of additional awards were made available to projects from DLNR in order to supplement HISC awards or address emergency issues. This included general funds administered by DOFAW as well as special funds transferred from the Special Land Development Fund administered by the Land Division of DLNR.

Table 4: DOFAW general funds disbursed in FY13 as supplements to HISC awards.

Organization	Project	Award
Kaua'i Invasive Species Committee	Kaua'i Island Invasive Species Detection & Control	\$84,463
Oahu Invasive Species Committee	O'ahu Island Invasive Species Detection & Control	\$84,463
Big Island Invasive Species Committee	Big Island Invasive Species Detection & Control	\$84,463
Moloka'i/Maui Invasive Sp. Committee	Detection & Control of Invasive Species in Maui County	\$84,463
Big Island Axis Deer Project	Eradication of Axis Deer from Hawai'i Island	\$10,750
DLNR Division of Aquatic Resources	Emergency response to Japanese Tsunami Marine Debris	\$3,600
Total		\$352,202

Table 5: DOFAW special funds disbursed in FY13 for invasive species work outside of the HISC budget process.

Organization	Project	Award
BIISC Axis Deer Project	Axis deer control staff & equipment	\$135,000
Hawai'i Ant Lab	Research and Control of Little Fire Ants	\$45,922
DLNR DOFAW Kaua'i Branch / Kaua'i Invasive Species Committee	Detection & Control of Mongoose on Kaua'i	\$100,000
Big Island Invasive Species Committee	Big Island Detection and Control (Supplement)	\$95,000)
DLNR DOFAW	Small Mammal Control Planner	\$35,000
O'ahu Invasive Species Committee	Detection & Control on O'ahu Island (Supplement)	\$20,000
DLNR Division of Aquatic Resources	Ballast Water and Hull Fouling Coordination (Supplement)	\$15,000
Total		\$445,922

The total amount of invasive species funding administered by DOFAW in FY13, including HISC funds and other DOFAW general and special funds, was \$2,598,124.

Details of projects that received HISC awards in FY13 are presented in Chapters V-VII of this report, separated by working group (Prevention, Control, and Outreach).

Summary of Project Achievements Supported by FY13 HISC Funds

HISC funding is used to support a wide variety of invasive species prevention, control, outreach, and research projects across the state. In most cases, HISC funding accounts for only a portion of the funding needed to support projects. Thus, HISC funds are highly leveraged using other state, federal, county, and private funding. The projects supported by these funds achieve incredible successes that are often difficult to see. For example, a mountain peak covered in ‘ōh‘ia or koa may seem like the status quo, but the fact that many of our mauka areas aren’t covered by invasive species like miconia is due to a lot of on-the-ground work by our funded partners.

The following data summary represents achievements by those HISC awardees in FY13 that worked on detection, control, and outreach of invasive species. Because the HISC funds a diverse assortment of projects, including aquatic control, policy development, and biocontrol research, a standardized reporting format representing all of our funded projects is difficult to visualize. Narrative reports for all projects, including those more difficult to quantify and summarize, can be found in Chapters V-VII of this report. For the purposes of creating the following data summaries, the figures below represent only the following projects: Big Island Invasive Species Committee, Big Island Axis Deer Project, Kaua‘i Invasive Species Committee, Maui & Molokai Invasive Species Committee, O‘ahu Invasive Species Committee, Maui Axis Deer Working Group, Kōke‘e Resource Conservation Program, and O‘ahu RC&D. The reporting for these data is based on the expenditure of FY13 HISC awards. Thus, the reporting period starts when project funds have been encumbered and are available for expense, and ends with the writing of this report (approximately October 2012-September 2013). Note that due to the time it takes to encumber state funds, many of these projects are continuing to spend their FY13 awards through calendar year 2013.

The projects below comprise **\$1,134,878 in HISC funds** (approximately 75% of the FY13 project budget). These projects leveraged their HISC funding with **\$3,677,927** in other state, federal, county, and private funds, **for a match ratio exceeding 3:1**.

Plant Detection and Control

Our funded projects spent **17,285 staff hours** detecting and controlling invasive plants, with an associated 4,872 hours provided by volunteers and partners. The total number of hours spent on plant detection and control during this reporting period (22,157 hours) is equivalent to 2,770 work days. If a single person were to take on this task, it would take them 53 years, with no vacation or holidays, to achieve this work.

The invasive plant *Miconia calvescens* is a priority for detection and control due to its ability to take over forests, shade out other plants, and increase erosion potential. FY13 HISC funds supported the removal of **459 mature miconia plants** and **28,233 immature (non-seeding) plants**.

Plant Detection and Control	
Acres surveyed	39,732
Acres controlled	260
Mature Plants Removed	28,599
Immature Plants Removed	74,294
Miconia mature plants removed	459
Miconia immature plants removed	28,233



OISC crewmember controlling a large mature Miconia in Manoa Valley

Animal Detection and Control

Invasive animals can have a huge impact here in Hawai'i, since our native ecosystems evolved in the absence of hooved ungulates, large land mammals, or reptiles and amphibians. FY13 HISC funds supported **6,273 staff hours** across all projects, with an associated 1,150 volunteer and partner hours. Of the animals detected, an astounding 97% were removed from Hawai'i's natural areas.



Pictured above is a BIISC staff member with the fourth axis deer removed from the Big Island

Much of the animal detection work currently funded by the HISC is focused on the eradication of axis deer from Hawai'i Island. HISC funds, along with other funding

sources, supported an incredible amount of survey effort on Hawai'i Island. Of the acres reported below, 2,371,997 acres were surveyed for axis deer using aerial and ground survey techniques. This figure includes repeat surveys in some locations. The remaining 1,464 acres were surveyed for other animal pests, including:

- Mongoose
- Rabbits
- Jackson's chameleon
- Coqui frog
- Little fire ant
- Yellow crazy ant
- Veiled chameleon
- Mitred conure
- Brown tree snake
- Naio thrips

Animal Detection and Control	
Acres surveyed (aerial and ground)	2,373,461
Animals detected	115
Animals controlled	112

Outreach

Educating the public about the impacts of invasive species is a core part of the HISC strategy. FY13 HISC funds supported a number of outreach staff through funded projects like the Invasive Species Committees. These staff provided **7,932 hours of outreach effort**, with an associated 734 hours provided by volunteers and partners. The estimated number of people reached by invasive species outreach efforts supported by FY13 HISC funding is **323,187 individuals**.

Individual Project Reports

Additional information on all projects funded in FY13 can be found in individual project reports in Chapters V-VII.

III. Advice to the Governor and Legislature Regarding Invasive Species



Governor Abercrombie convenes a meeting of the HISC in June of 2011.

Chapter 194, HRS, requires the HISC to advise the Governor and the legislature on issues regarding invasive species. The HISC fulfills this mandate is by adopting resolutions, drafting legislation, submitting testimony during the legislative session, and by providing other relevant advice in this annual report.

FY13 Resolutions of the Hawai'i Invasive Species Council

The HISC adopted three resolutions in FY13, all related to federal invasive species issues. Through collaboration with federal partners participating in the Coordinating Group on Alien Pest Species (CGAPS) and the National Invasive Species Council, four federal issues relating to biosecurity in Hawai'i were identified as issues to be discussed by the HISC. The HISC discussed these issues at a public meeting on June 4, 2013. One issue, support for federal recognition of agricultural inspections as a core airport function, was tabled due to concerns over how the Federal Aviation Administration relates to State agencies, including the Hawai'i Department of Transportation. Discussion regarding the remaining three issues resulted in the adoption of the following resolutions:

- **Resolution 13-1:** Support for federal recognition of Hawaii's unique biosecurity needs and coordination between federal and state inspection agencies, including information sharing between federal and state inspection staff and the development of joint inspection facilities
- **Resolution 13-2:** Supporting the reauthorization of the Brown Tree Snake Control and Eradication Act of 2004
- **Resolution 13-3:** Supporting amendments to the list of injurious species under the Lacey Act.

Copies of these resolutions are provided on the following pages.

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

SHAN TSUTSUI
LIEUTENANT GOVERNOR



HAWAII INVASIVE SPECIES COUNCIL
1151 PUNCHBOWL ST, #325
HONOLULU, HAWAII 96813

VOTING MEMBERS
WILLIAM J. AILA, JR
DEPARTMENT OF LAND & NATURAL
RESOURCES
RUSSELL KOKUBUN
DEPARTMENT OF AGRICULTURE
GARY GILL
DEPARTMENT OF HEALTH
MARIA GALLO, PhD
UNIVERSITY OF HAWAII
JESSE SOUKI
OFFICE OF PLANNING, DEPARTMENT OF
BUSINESS, ECONOMIC DEVELOPMENT &
TOURISM
DAVID RODRIGUEZ
DEPARTMENT OF TRANSPORTATION

RESOLUTION 13-1

SUPPORTING FEDERAL RECOGNITION OF HAWAII'S UNIQUE BIOSECURITY NEEDS AND COORDINATION BETWEEN FEDERAL AND STATE INSPECTION AGENCIES, INCLUDING INFORMATION SHARING BETWEEN FEDERAL AND STATE INSPECTION STAFF AND THE DEVELOPMENT OF JOINT INSPECTION FACILITIES

WHEREAS, the U.S. Plant Protection Act of 2000¹ provides for federal preemption of State regulation in foreign commerce any plant, plant pest, noxious weed, or plant product in order to prevent the introduction or dissemination of a plant pest or noxious weed; and

WHEREAS, the U.S. Plant Protection Act of 2000² provides exceptions for federal preemption only for interstate commerce when a State demonstrates a special need for additional prohibitions or restrictions based on sound scientific data or a thorough risk assessment; and

WHEREAS, the Commerce Clause of the U.S. Constitution³ provides that the U.S. Congress shall have power to regulate commerce with foreign nations and between the States; and

WHEREAS, the State of Hawaii receives foreign commerce from a variety of nations and from the mainland United States; and

WHEREAS, the environment of the State of Hawaii is distinct from other States or political subdivisions of the U.S. due to its unique ecology as an isolated volcanic island chain with high rates of endemism among its plant and animals species; and

WHEREAS, the State of Hawaii has unique biosecurity needs that are distinct from other States or political subdivisions of the U.S.; and

WHEREAS, the Hawaii Invasive Species Council shall coordinate and promote the State of Hawaii's position with respect to federal issues⁴; now, therefore

¹ 7 USC § 7756.

² 7 USC § 7756.

³ U.S. Const. art. I., § 8, cl. 3.

⁴ HRS 194-2 (a) (5)

BE IT RESOLVED that the Hawaii Invasive Species Council supports federal recognition of the State of Hawaii's unique biosecurity needs through measures including, but not limited to, expedited exemptions from federal preemption for State regulation in foreign or interstate commerce of high-risk pests that are not present in the State of Hawaii; and

BE IT FURTHER RESOLVED that the Hawaii Invasive Species Council supports the restriction of importation of all plants in the family Myrtaceae in order to prevent the introduction of new strains of ohia rust (*Puccinia psidii*) into the State of Hawaii; and

BE IT FURTHER RESOLVED that the Hawaii Invasive Species Council supports coordination and information sharing between federal and state inspection agencies, including but not limited to import manifests and interception data, for the purpose of identifying pests of both federal and state concern in all commerce; and

BE IT FURTHER RESOLVED that the Hawaii Invasive Species Council supports the development of joint federal and state inspection facilities for cargo entering Hawaii as the most practical and cost-effective option for federal and state biosecurity operations; and

BE IT FURTHER RESOLVED that certified copies of this Resolution be transmitted to the Governor of Hawaii, delegates from Hawaii to the U.S. Congress, and the U.S. Secretary of Agriculture, and the chairperson of the Hawaii Board of Agriculture.

Adopted by the Hawaii Invasive Species Council on the following date: June 4, 2013



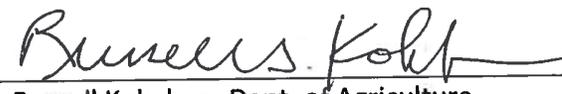
William J. Aila, Jr., Dept. of Land & Natural Resources



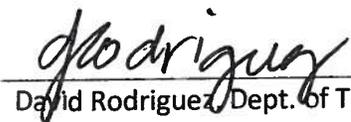
Gary Gill, Dept. of Health



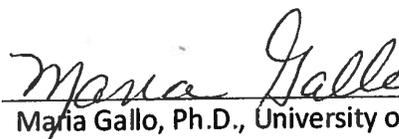
Jesse Souki, Office of Planning, Dept of Business, Economic Development, and Tourism



Russell Kokubun, Dept. of Agriculture



David Rodriguez, Dept. of Transportation



Maria Gallo, Ph.D., University of Hawaii

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

SHAN TSUTSUI
LIEUTENANT GOVERNOR



HAWAII INVASIVE SPECIES COUNCIL
1151 PUNCHBOWL ST, #325
HONOLULU, HAWAII 96813

VOTING MEMBERS
WILLIAM J. AILA, JR
DEPARTMENT OF LAND & NATURAL
RESOURCES
RUSSELL KOKUBUN
DEPARTMENT OF AGRICULTURE
GARY GILL
DEPARTMENT OF HEALTH
MARIA GALLO, PhD
UNIVERSITY OF HAWAII
JESSE SOUKI
OFFICE OF PLANNING, DEPARTMENT OF
BUSINESS, ECONOMIC DEVELOPMENT &
TOURISM
DAVID RODRIGUEZ
DEPARTMENT OF TRANSPORTATION

RESOLUTION 13-2

SUPPORTING THE REAUTHORIZATION OF THE BROWN TREE SNAKE CONTROL AND ERADICATION ACT OF 2004

WHEREAS, the brown tree snake (*Boiga irregularis*) is an invasive species outside of its native range and has severely impacted the native bird populations and quality of life on Guam; and

WHEREAS, the introduction of the brown tree snake to Hawaii has the potential to devastate Hawaii's native bird populations; and

WHEREAS, the economic impact of the introduction of brown tree snake to Hawaii related to power outages, medical costs, and impacts to tourism is estimated to be as much as \$2,140,000,000 annually¹; and

WHEREAS, the report from the House Committee on Resources accompanying the federal Brown Tree Snake Control and Eradication Act of 2004² states that the brown tree snake poses a direct, significant, and growing threat of dispersal to other areas outside its historic range, including the State of Hawaii and the mainland United States; and

WHEREAS, the Brown Tree Snake Control and Eradication Act of 2004³ authorized the establishment and sustained funding for vertebrate pest management in Hawaii and U.S. Pacific territories and positions by the federal Animal Plant and Health Inspection Service, Wildlife Services, Operations Program State Office, as well as the provision of sustained research funding for the Fort Collins Science Center of the U.S. Geological Survey related to the brown tree snake; and

WHEREAS, the Brown Tree Snake Control and Eradication Act of 2004⁴ appropriated funds for relevant detection, control and research activities through the federal Animal and Plant Health

¹ Shwiff, S. A.; Gebhardt, K.; Kirkpatrick, K. N.; Shwiff, S. S. 2010. Potential economic damage from introduction of brown tree snakes, *Boiga irregularis* (Reptilia: Colubridae), to the Islands of Hawaii. *Pacific Science*, vol. 64, no. 1:1-10.

² H Rep. 108-687, at 1-2 (2004)

³ 7 USC §§ 8501-8507

⁴ 7 USC §§ 8501-8507

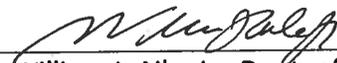
Inspection Service, the U.S. Office of Insular Affairs, and the U.S. Fish and Wildlife Service, and the U.S. Geological Survey from 2006 through 2010; and

WHEREAS, the Hawaii Invasive Species Council shall coordinate and promote the State of Hawaii's position with respect to federal issues⁵; now, therefore

BE IT RESOLVED that the Hawaii Invasive Species Council supports the reauthorization of the Brown Tree Snake Act of 2004, including new appropriations for funding related to brown tree snake coordination, detection, control, and research; and

BE IT FURTHER RESOLVED that certified copies of this Resolution be transmitted to the Governor of Hawaii, delegates from Hawaii to the U.S. Congress, the U.S. Secretary of Agriculture, the U.S. Secretary of Defense, the U.S. Secretary of the Interior, the U.S. Secretary of Transportation, the chairperson of the Hawaii Board of Agriculture, and the chairperson of the Hawaii Board of Land and Natural Resources.

Adopted by the Hawaii Invasive Species Council on the following date: June 4, 2013



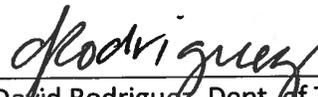
William J. Aila, Jr., Dept. of Land & Natural Resources



Russell Kokubun, Dept. of Agriculture



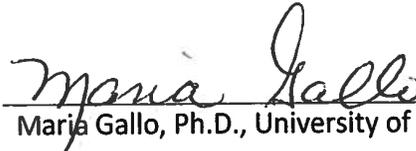
Gary Gill, Dept. of Health



David Rodriguez, Dept. of Transportation



Jesse Souki, Office of Planning, Dept of Business, Economic Development, and Tourism



Maria Gallo, Ph.D., University of Hawaii

⁵ HRS 194-2 (a) (5)

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

SHAN TSUTSUI
LIEUTENANT GOVERNOR



HAWAII INVASIVE SPECIES COUNCIL
1151 PUNCHBOWL ST, #325
HONOLULU, HAWAII 96813

VOTING MEMBERS
WILLIAM J. AILA, JR
DEPARTMENT OF LAND & NATURAL
RESOURCES
RUSSELL KOKUBUN
DEPARTMENT OF AGRICULTURE
GARY GILL
DEPARTMENT OF HEALTH
MARIA GALLO, PhD
UNIVERSITY OF HAWAII
JESSE SOUKI
OFFICE OF PLANNING, DEPARTMENT OF
BUSINESS, ECONOMIC DEVELOPMENT &
TOURISM
DAVID RODRIGUEZ
DEPARTMENT OF TRANSPORTATION

RESOLUTION 13-3

SUPPORTING AMENDMENTS TO THE LIST OF INJURIOUS SPECIES UNDER THE LACEY ACT

WHEREAS, the Lacey Act prohibits the import, export, transportation, sale, receipt, acquisition, or purchase of prohibited wildlife species¹; and

WHEREAS, the list of Injurious Wildlife regulated by the Lacey Act does not fully address the biosecurity needs of the States, including Hawaii, with regard to preventing the introduction of invasive vertebrate pests; and

WHEREAS, the U.S. Fish and Wildlife Service in 2010 proposed the addition of nine species of large constructor snakes to the list of Injurious Wildlife, including Indian python, Northern African python, Southern African python, yellow anaconda, reticulated python, boa constrictor, DeSchauensee's anaconda, green anaconda, and Beni anaconda; and

WHEREAS, five of these species were not subsequently added to the list of Injurious Wildlife, including the reticulated python, boa constrictor, DeSchauensee's anaconda, green anaconda, and Beni anaconda; and

WHEREAS, there are no snakes native to the State of Hawaii; and

WHEREAS, forty-two boa constrictors and two reticulated pythons have been recovered in Hawaii between June 1990 and December 2011²; and

WHEREAS, the introduction of these snake species to Hawaii poses a significant risk to Hawaii's environment, economy, and way of life; and

WHEREAS, the Hawaii Invasive Species Council shall coordinate and promote the State of Hawaii's position with respect to federal issues³; now, therefore

¹ 16 USC § 3371-3378

² Kraus, F.; Cravalho, D. 2001. The Risk to Hawaii from Snakes. Pacific Science, vol. 55, no. 4:409-417 for data between June 1990 and June 2000; unpublished Hawaii Department of Agriculture data for July 2000 to December 2011 snake recovery data.

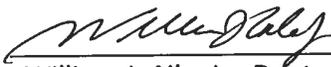
³ HRS 194-2 (a) (5)

BE IT RESOLVED that the Hawaii Invasive Species Council supports the continuation of the listing process for additions to the list of Injurious Wildlife under the Lacey Act; and

BE IT FURTHER RESOLVED that the Hawaii Invasive Species Council supports the addition to list of Injurious Wildlife under the Lacey Act of constrictor snakes including the reticulated python, boa constrictor, DeSchaunsee's anaconda, green anaconda, and Beni anaconda; and

BE IT FURTHER RESOLVED that certified copies of this Resolution be transmitted to the Governor of Hawaii, delegates from Hawaii to the U.S. Congress, the U.S. Secretary of the Interior, the chairperson of the Hawaii Board of Agriculture, and the chairperson of the Hawaii Board of Land and Natural Resources.

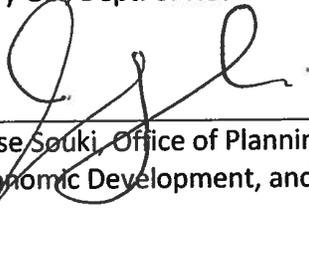
Adopted by the Hawaii Invasive Species Council on the following date: June 4, 2013



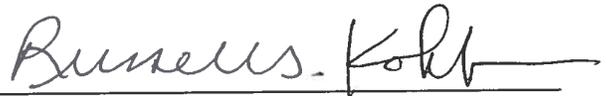
William J. Aila, Jr., Dept. of Land & Natural Resources



Gary Gill, Dept. of Health



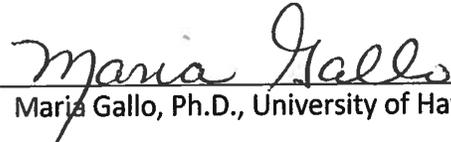
Jesse Souki, Office of Planning, Dept of Business, Economic Development, and Tourism



Russell Kokubun, Dept. of Agriculture



David Rodriguez, Dept. of Transportation



Maria Gallo, Ph.D., University of Hawaii

HISC Testimony Provided During the 2013 Legislative Session

2013 marked the first year in which the HISC provided testimony during legislative sessions. Bills supported included:

- Support for HB934/HB357/SB1165: **RELATING TO SINGLE-USE CHECKOUT BAG FEES**. These bills sought the collection of a 10-cent fee for single-use checkout bags. This bill allows businesses to retain a portion of the remittance, with net revenues being 1) deposited in the environmental response revolving fund administered by the Department of Health and 2) deposited into the natural area reserve fund for watershed management and invasive species control projects administered by the Department of Land and Natural Resources. **These bills did not pass.**
- Support for HB857/SB1088/SB17: **RELATING TO SUSTAINABILITY**. These bills sought to restore the intent of the environmental response, energy, and food security tax, to provide funding to relevant programs at the Department of Health, Department of Business, Economic Development and Tourism, and the Department of Agriculture. **These bills did not pass.**
- Support for HB200/SB1061: **RELATING TO THE STATE BUDGET**. These bills sought to:
 - Provide the HISC with \$1M/yr in general funding via the DLNR budget. **This portion of the bill was reduced to \$750,000/yr.**
 - Restore eight Vector Control Worker positions at the Department of Health. **Four positions were restored.**
- Support for HB935/SB1166: **RELATING TO THE CONVEYANCE TAX**. These bills sought to amend the conveyance tax only on certain high value properties (those over \$2M in value) and sought to increase the portion of revenues going to the natural area reserve fund for watershed protection. This bill would have added invasive species programs (including the HISC) as designated beneficiaries of the natural area reserve fund. **These bills did not pass.**

Legislative Resolutions Passed in 2013 Relevant to the HISC

The following resolution, introduced by Senator Ruderman of Hawai'i Island, passed in the State Senate as Senate Resolution 41: *Urging the invasive species council to develop and implement a comprehensive interagency plan for the control and eradication of albizia throughout the state; starting with the island of hawaii, and to partner to utilize albizia trees that are removed and urging the department of agriculture to investigate biocontrol agents for the control of albizia.*

In FY13 the HISC Support Staff hired an Invasive Species Planner. This position will primarily focus on creating a new strategic plan for the HISC, but will also assist in other planning efforts, including the development of a control plan for Albizia as directed by SR41.

IV. Hawai'i Invasive Species Council Reports

HISC Meetings in Fiscal Year 2013

Minutes for meetings of HISC and working groups are available <http://hisc.hawaii.gov>

1) August 3, 2012: Approval of HISC FY13 Budget

In FY13 the HISC approved spending plan for \$1,800,000 to fund projects relating to invasive species prevention, control, and outreach. The accomplishments of each project are subsequently described in this report, organized by focus area:

- Prevention: \$136,429
- Control: \$1,136,102
- Research: \$0*
- Outreach: \$201,000
- HISC support and mandatory Central Services fees: \$326,468

*Funding for Research and Technology has not been provided in recent years due to a sharp reduction in the amount of special and general funds made available to the HISC.

2) January 8, 2013: Identification of FY13 Policy Goals

The HISC discussed a number of policy goals and identified which goals could be feasibly undertaken in FY13.

- Both DLNR and HDOT requested funding for HISC in their biennium budget requests. HDOT's request, via Ford, was rejected on the grounds that FAA funding cannot be spent on issues that are not "core airport functions."
- The HISC approved a process by which the Council may submit testimony during the State legislative session and discussed a package of bills for which testimony would be drafted.
- A number of federal invasive species policy issues that impact the State of Hawai'i were reviewed by Christy Martin, PIO for the Coordinating Group on Alien Pest Species (CGAPS). The HISC requested draft resolutions based on these issues.

3) June 4, 2013: Federal Issues Regarding Invasive Species

The HISC reviewed the outcome of the **legislative funding initiatives that were not approved**, including:

- Request to add HISC as a beneficiary of the Natural Area Reserve Fund and increase revenues via Conveyance Tax amendments
- Request to amend Barrel Tax revenue disbursements
- HISC general fund request in DLNR budget reduced from \$2M/yr to \$750K/yr

The HISC reviewed four draft resolutions:

- Support for federal recognition of Hawaii's unique biosecurity needs and coordination between federal and state inspection agencies, including information sharing between federal and state inspection staff and the development of joint inspection facilities (Approved, see Ch. II)
- Supporting federal recognition of pest inspections as a core airport function (Not approved, due to complications with FAA requirements for HDOT spending)
- Supporting the reauthorization of the Brown Tree Snake Control and Eradication Act of 2004 (Approved, see Ch. II)
- Supporting amendments to the list of injurious species under the Lacey Act (Approved, see Ch. II)

FY13 HISC Support Staff Achievements

Support staff in FY13 included a HISC Coordinator, a Communications Coordinator, and a HISC Planner. HISC support costs comprised \$146,470 of the FY13 budget. FY13 achievements included:

- Coordinated three council meetings, one co-chair focus meeting, and five working group meetings
- Disbursed of \$1.8M in HISC awards
- Represented the HISC at a Brown Tree Snake Technical Working Group meeting in Nov. 2012
- Represented the HISC as a new member of the Hawai'i Conservation Alliance
- Worked with Senator Gabbard's office for the coordination of a legislative informational briefing on invasive species
- Drafted testimony for the HISC during the 2013 legislative session
- Drafted Resolutions 13-1, 13-2, and 13-3
- Coordinated the first Hawai'i Invasive Species Awareness Week in March of 2013
- Coordinated meetings with US Congressional delegates from Hawai'i to discuss biosecurity and invasive species

HISC creates the first ever Hawai'i Invasive Species Awareness Week

In 2013 the HISC hosted Hawai'i Invasive Species Awareness Week, to showcase the unique needs of Hawai'i in regard to invasive species and to invite the public to volunteer and get involved. The week's events and awards were coordinated in partnership with HISC member agencies, the Coordinating Group on Alien Pest Species (CGAPS), county-based Invasive Species Committees, Hawai'i Conservation Alliance, Hawai'i Biodiversity Information Network, and The Nature Conservancy (TNC).



Governor Neil Abercrombie provided an official proclamation for the first Hawaii Invasive Species Awareness Week (HISAW), from March 4-8, 2013. His address to the audience at a HISAW kickoff ceremony at the Hawaii State Capitol on March 4 focused on the need to whatever resources are available to mitigate invasive species impacts and protect our valuable natural resources, economy, and way of life. He referenced the Hawaii state motto, *Ua Mau Ke Ea O Ka 'Aina I Ka Pono*, and said that we all must do what is *pono* in protecting Hawaii.

HISAW NUMBERS AT A GLANCE

- 60 attendees at the Capitol kickoff event
- 8 HISC Award winners recognized
- 8 State Legislators presented awards
- 3 TV news outlets covered the event
- 12 public events organized across the state
- 158 participants in online Hawai'i BioBlitz
- 362 species "spottings" posted and identified on the site
- \$2400 in prize donations for Maui's "Spot the Ant" contest
- 8 people removed weeds with Manoa Cliff Trail Project
- 8 people removed weeds from Lyon Arboretum with OISC
- 34 people pulled weeds from Mauna Kea with Hawai'i Island Chamber of Commerce
- 47 people pulled invasive limu and mangrove seedlings at Kaneohe fishponds with TNC and DAR
- 6000 pounds of invasive algae removed

2013 HISC AWARDS

The kickoff to the first Hawaii Invasive Species Awareness Week included the first Hawaii Invasive Species Council Awards ceremony, in which eight individuals and organizations from across the state were recognized for their contributions to protecting Hawaii from invasive species. The eight winners, along with a number of honorable mentions, were selected from approximately 40 nominations.



2013 Award Winners

- **Greatest Hit of 2012: Kauai Invasive Species Committee**, with honorable mentions to the Pohakuloa Training Area Natural Resources Office and HDOT Highways Division
- **Above and Beyond: Scott Godwin, Papahānaumokuākea MNM**, with honorable mentions to Dr. Fern Duvall and Dr. Arnold Hara,
- **Business Leader: Young Brothers, Ltd.**, with honorable mentions to Kailua Sailboards & Kayaks, Inc., and Whole Foods
- **Community Hero: Mary Begier & the Hawaii Island Chamber of Commerce**, with honorable mentions to Katie Cassel and Celia Smith
- **Kauai MVP: Craig Kaneshige, HDOA**
- **Oahu MVP: Mashuri Waite, Lyon Arboretum**, with honorable mentions to Honolulu Botanical Garden and Marine Corps Base Hawaii
- **Maui County MVP: Peter Vorhes, Windward Aviation**, with honorable mentions to Pat Bily and Paul Miller
- **Hawaii County MVP: Hawaii Cattlemen's Council**, with honorable mentions to Malama O Puna and Tim Tunison



Members of the legislature including **Senator Mike Gabbard, Senator Mālama Solomon, Senator Kalani English, Representative Dee Morikawa, Representative James Tokioka, Senator Russell Ruderman, and Representative Derek Kawakami** presented the awards to their constituents. In addition to HISC awards, Senate Recognition certificates were graciously provided by **Senator Clarence Nishara**.



Proclamation

Presented

In Recognition of Hawai'i Invasive Species Awareness Week

WHEREAS, the Hawai'i Invasive Species Council was established by HRS 194-2 in 2003, "...for the special purpose of providing policy level direction, coordination, and planning among state departments, federal agencies, and international and local initiatives for the control and eradication of harmful invasive species infestations throughout the State and for preventing the introduction of other invasive species that may be potentially harmful"; and

WHEREAS, the Hawai'i Invasive Species Council has prioritized invasive species outreach efforts to increase awareness about the unique threat that invasive species pose to Hawai'i as an island state, and our high number of rare and endemic native species; and

WHEREAS, the Hawai'i Invasive Species Council acknowledges that a key priority of Governor Neil Abercrombie's "New Day in Hawai'i" Plan is to improve the prevention, management, and response systems for invasive species; and

WHEREAS, the Hawai'i Invasive Species Council, which is co-chaired by William Aila, Jr., Chairman of the State Department of Land and Natural Resources, and Russell Kokubun, Chairman of the State Department of Agriculture, has prioritized invasive species outreach efforts during "Hawai'i Invasive Species Awareness Week," recognized in March 2013 to coincide with the "National Invasive Species Awareness Week";

NOW, THEREFORE, I, NEIL ABERCROMBIE, Governor, and **I, SHAN S. TSUTSUI**, Lieutenant Governor for the State of Hawai'i, do hereby proclaim March 4-8, 2013, as

"HAWAII INVASIVE SPECIES AWARENESS WEEK"

in Hawai'i and ask the people of the Aloha State to join us in recognizing the importance of preventing and controlling harmful invasive species, in order to protect our natural resources, our economy and our way of life.

DONE at the State Capitol, in the Executive Chambers, Honolulu, State of Hawai'i, this twenty-eighth of February, 2013.



NEIL ABERCROMBIE
Governor, State of Hawai'i



SHAN S. TSUTSUI
Lt. Governor, State of Hawai'i

Overview of the Invasive Species Problem in Hawai'i

The silent invasion of Hawai'i by insects, disease organisms, snakes, weeds, and other pests is the single greatest threat to Hawai'i's economy, natural environment and to the health and lifestyle of Hawai'i's people. Pests already cause millions of dollars in crop losses, the extinction of native species, the destruction of native forests, and the spread of disease, but many more harmful pests now threaten to invade Hawai'i and wreak further damage. Even one new pest, like the brown tree snake or the red imported fire ant, could forever change the character of our islands. Stopping the influx of new pests and containing their spread is essential to Hawai'i's current and future wellbeing.

Plants: More than 10,000 flowering plants have been introduced into Hawai'i from the temperate or tropical zones of every major continent and about 1,215 have established wild populations in Hawai'i, roughly equivalent to the number of native vascular plant species in Hawai'i. New species continue to be introduced by plant collectors, gardeners and the nursery industry. Formerly cultivated species are "jumping the fence" and establishing self-sustaining populations. Only a subset of the nonnative species introduced to Hawai'i are considered "invasive," as they pose a significant threat to human health, the environment, and natural or cultural resources. Of the 1,215 established nonnative plant species, 107 species are considered serious invaders occupying space and competing with native plants in natural areas.

Animals: At least 19 alien mammals are established in the wild. A few feral species have far reaching impacts in natural areas altering forest composition and structure; damaging and consuming rare species that occur only in Hawai'i. Many act as vectors of diseases that affect people and domestic animals. Rats, mongoose, feral goats, sheep, deer, pigs, and cats impact native ecosystems and bring threatened species closer to extinction. Other terrestrial vertebrate species, including birds (55 species), reptiles (24 species) and amphibians (six species), are established in Hawai'i in surprising numbers; they impact natural area values and the economy. In 2011 axis deer (*Axis axis*) were discovered on Hawai'i Island, where they had not previously been found. The transportation of axis deer to Hawai'i Island from Maui and/or Moloka'i presents a serious threat to Hawai'i Island's native forests and species. Priority and urgency should be given to the eradication of incipient populations of feral ungulates, island-wide eradications of vertebrates, and finally management of areas with high native biodiversity, cultural, social or economic value.

Arthropods: A number of serious arthropod pests have been documented in Hawai'i in the past 15 years. To prevent further introductions, more needs to be done to manage pathways, including building inspection and treatment infrastructure into Hawai'i's ports, inspections and treatment of at risk goods, and research into risk abatement strategies. Invasive arthropods documented as new to Hawai'i from 2003-2013 include:

- Pickleworm – 2003
- Cardin's Whitefly – 2003
- Papaya Mealybug – 2004
- *Aedes japonicus* (Type of Mosquito) – 2004
- Large Orange Sulfur – 2004
- Glassy-Winged Sharpshooter – 2004
- Macadamia Felted Coccid – 2005
- *Thrips Parvispinus* – 2006
- Asian Citrus Psyllid – 2006
- Varroa Mite – 2007
- Whitefly Parasitoid – 2007
- Thrips, *Dichromothrips smithi* – 2007
- Scarabaeid Beetle, *Cyclocephala pasadenae* – 2007
- Scarabaeid Beetle, *Temnorhynchus retusus* – 2007
- Asian horntail wasp - 2009
- Myoporum thrips – 2009
- Lobate lac scale- 2012

Coqui Frog

The Puerto Rican tree frog, *Eleutherodactylus coqui*, has the potential to change native forest ecosystems. Population densities in some areas of Hawai'i have been recorded to be as high as three times the density found in Puerto Rico. Their nightly mating choruses can reach levels as high as 73 db, which is comparable to moderate to heavy vehicle traffic. Economic effects on the Big Island, stemming from their nightly choruses, have been felt through declining property values and a reduction of plant sales from nurseries.

Hawai'i Island: By far, the worst coqui frog problem is on the Big Island. The main goal on the Big Island is to keep pristine natural areas free of the frogs, and to help the community control frogs around residential areas. With so much land on the Big Island infested (see map), the efforts to control frogs are only practical in a limited number of sites. Coqui frogs infested 60,000 acres on the Big Island in 2009.

Maui: The Maui Invasive Species Committee (MISC) has successfully eradicated a number of isolated, satellite populations of coqui, though a handful remain across the island. MISC work on the coqui frog now focuses on a large population in Māliko Gultch, a long, steep-sided gultch on the Island's north shore.

O'ahu: Coqui frog reports on O'ahu came from a variety of locations around in island in FY13. HDOA and the O'ahu Invasive Species Committee (OISC) collaborate to respond to coqui frogs as quickly as possible. The reduction in staffing at both HDOA and OISC in recent years has limited the number of staff available to respond to coqui reports.

Kaua'i: In addition to periodic reports of new arrivals of coqui frogs, Kaua'i had an established population of coqui in Lawai. Following a strategic eradication effort, the Kaua'i Invasive Species Committee declared Kaua'i "coqui free" in FY12 upon the one-year anniversary of the last reported coqui call on Kaua'i.

Mitigation of Disease Vectors Requires Restoration of DOH Vector Control Branch

Budget cuts at DOH have resulted in a sharp reduction in the staff and capabilities of the Vector Control Branch, meaning that many diseases and disease vectors are not being sufficiently monitored. Where Honolulu International Airport used to host approximately 100 mosquito traps, the number of traps in 2012 was roughly four. The remaining traps at Honolulu International Airport are the only routine mosquito surveillance conducted on O'ahu. The Department of Health detected the *Aedes aegypti* mosquito at the Honolulu International Airport in March of 2012. This mosquito has the ability to spread dengue and yellow fevers. In 2011, six cases of dengue fever were investigated by DOH.

In the 2013 legislative session, DOH sought funding to restore eight Vector Control positions of the roughly 40 positions that were lost during the recent recession. Four positions were approved by the state legislature. Proper restoration of the Vector Control Branch at DOH should remain a priority for the state legislature.

Biocontrol

Biocontrol is one of the least understood tools for the control of invasive weeds and other pests yet it can be one of the most successful means of controlling widespread invasive species throughout its range. Myths and misconceptions that have been nearly impossible to dispel (for example, mongoose were not introduced to Hawai'i as part of a government sponsored biocontrol program, despite the

common misconception that mongoose represent an early attempt at biocontrol) offset the very successful track record of biological control in Hawai'i dating back to the reign of King David Kalākaua. Modern biocontrol agents are carefully screened to ensure that agents are highly likely to only attack a target invasive species and will not have secondary negative impacts to other species. A successful biological control program reduces or, in some cases, removes the need for conventional methods of control for an invasive species. It is targeted to a particular species or group of closely related species (usually plants or invertebrates) and, once established, the agents continue to provide benefits with no external inputs. The comprehensive testing systems now available allow us to select agents that are highly specific to the targeted invasive species.

In Hawai'i, two principles of biocontrol are followed: classical biocontrol and augmentative biocontrol. Classical biocontrol involves the identification use of natural enemies (either insects or diseases) within the native range of a pest for release into the environment the pest has established itself in. This process either requires exploration or collaboration. At the present time, foreign exploration is limited to one exploratory entomologist in the State of Hawai'i. The HISC has funded exploratory projects conducted by HDOA and UH. The second form of biocontrol, augmentative biocontrol, involves the collection and release of biological control agents already established but of limited distribution. HDOA conducts projects such as this for newly established pests with natural enemies that are already established. One recent and successful augmentation project is the biocontrol of the papaya mealybug, a severe pest of papaya and plumeria in Hawai'i. In 2010, HDOA released a tiny parasitic wasp, *Aroplectrus dimerus*, as a biocontrol agent for the invasive stinging nettle caterpillar (*Darna pallivitta*).



Nettle caterpillar, *Darna pallivitta*

V. HISC Prevention Working Group

Prevention Working Group Goals

- Review risks of pest/invasive species entry into the State
- Implement measures and improve Hawai'i's capacity to prevent the entry of new pests/invasive species with shared resources and shared responsibilities of all agencies.
- A more detailed list of goals for the Prevention Working Group is in the HISC Strategy 2008-2013.

Funded Projects for FY13

The lead agency and chair for the Prevention Working Group is HDOA. In FY13, the Prevention Working Group funded three projects, totaling \$136,429:

- 1) *Hawai'i-Pacific Weed Risk Assessment (HPWRA)*, proposed by HPWRA staff: \$71,032.
- 2) *Ballast Water and Hull Fouling Coordinator*, proposed by the Division of Aquatic Resources, DLNR: \$30,547
- 3) *Hawai'i Ant Lab Core Funding*, proposed by the Hawai'i Ant Lab: \$34,851 (Reported with other awards to the Hawai'i Ant Lab under Chapter VI: HISC Control Working Group)

Key Activities in FY13

- 1,456 plant species assessed for the potential to be invasive in Hawaii
- Reconvening of the Alien Aquatic Organism Task Force
- Response to Japanese Tsunami Marine Debris in Hawaii



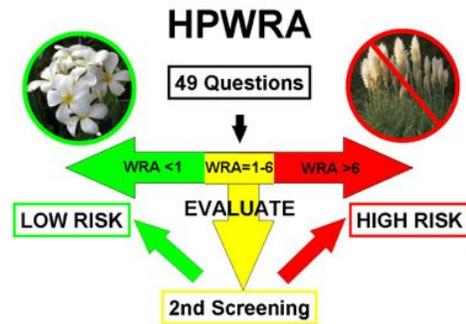
Little fire ant, *Wasmannia auropunctata*

Title: Continued Support of the HPWRA

Organization: Hawaii-Pacific Weed Risk Assessment (HPWRA)

Award(s): \$71,032

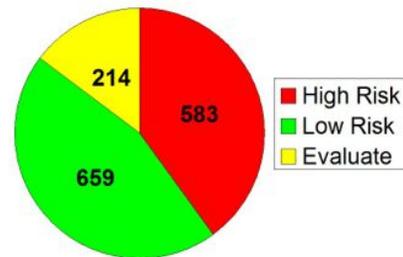
Introduction: The Hawaii-Pacific Weed Risk Assessment (HPWRA) system is an internationally recognized screening tool that rates a plant’s potential to become invasive by answering 49 questions about its biology, ecology and history of invasiveness elsewhere. The answers generate a score that predicts a plant’s likelihood to be invasive in Hawaii or other tropical Pacific islands. The HPWRA aids in identification of invasive plants before they impact Hawaii’s economy, ecology or human health and supports Goal one of the Prevention working group, to “review risks of pest/invasive species entry into the state”. The HPWRA also addresses the Prevention objectives to “develop a comprehensive ‘approved planting list’ to ensure that invasive species are not being planted in State projects or by any state contractors, e.g. screened by the Weed Risk Assessment protocol” and to “develop collaborative industry guidelines and codes of conduct, which minimize or eliminate unintentional introductions.” In accordance with these objectives, one Weed Risk Assessment Specialist has been 100% funded by the Hawaii Invasive Species Council to the amount of \$71,032 in FY13.



Achievements in FY13

[Deliverable 1] Annual report to the legislature: Annual reports are submitted documenting HPWRA progress and accomplishments for inclusion in HISC legislative reports.

[Deliverable 2] Expanded List of Assessments: The HPWRA provides new and updates old assessments, both for species already present in the Hawaiian Islands, as well as for new introductions. This information is summarized and disseminated to the requesting individual or agency via direct correspondence, and to the public and land management agencies through technical and general publications, public presentations, and other outreach activities. From July 2012 to June 2013, 188 assessment requests were received, and 148 new and 8 updated assessments were completed, despite reduction in HPWRA staff to one position beginning in January 2013.



1,456 Risk Assessments by Category

As of June 30, 2013, 1,456 assessments have been completed and assigned to the following categories:

- High Risk (583 plants): Predicted to become invasive in Hawaii or Pacific Island ecosystems
- Low Risk (659 plants): Not predicted to become invasive
- Evaluate (214 plants): Needs further information to make a prediction of invasiveness

[Deliverable 3] Public presentations and Outreach: To promote awareness and encourage adoption of the HPWRA system, the WRA Specialist is involved in additional outreach activities with partner agencies and interested parties. The following highlights outreach activities and efforts from July 2012 – June 2013:

- 02 Aug: Presentation on tsunami impacts to native and invasive plants at the Hawaii Conservation Conference



Presentations to Master Gardeners

- 17 Jul: Presentation on invasive biofuels at Roundtable on Sustainable Biofuels meeting
- 19 Feb: WRA & invasive plant presentation to Kona Master Gardeners
- 09 Apr: WRA & invasive plant presentation to Hilo Master Gardeners class
- 16 Apr: Submitted article on edible native plants for "Hawaii Landscape" magazine
- 12 Jun: WRA presentation to Kauai Master Gardeners

[Deliverable 4] Hpwra.org & Partner Website

Updates: All new and previously completed assessments continue to be posted at hpwra.org. This site allows users to download any individual assessment, as well as a regularly updated list of all assessments completed to date. From July 1, 2012 to June 30, 2013, the website received 1,380 visits and 6,565 page views, demonstrating a continued interest and need for risk assessment predictions to make informed planting decisions. With the fall 2012 launch of the Plant Pono website, a more user-friendly, non-academic planting site with HPWRA-generated content, and the recent hiring of a Plant Pono and Weed Risk Assessment Liaison in April 2013, it is anticipated that greater interest in and utilization of weed risk assessments will be generated in the future.



Plant Pono WRA Page

Summary of website developments (July 2012 – June 2013):

- 1,456 assessments posted to hpwra.org (<https://sites.google.com/site/weedriskassessment/home>)
- 1316 assessments posted to Plant Pono (www.plantpono.org/)
- 205 assessments provided for posting on the Pacific Island Ecosystems at Risk site (<http://www.hear.org/Pier/>)
- HPWRA Project website (<https://sites.google.com/site/hpwraproject/>) provides access to the work calendar, quarterly and annual reports, and other HPWRA-related documentation.

[Deliverable 5] Respond to public inquiries directed to Maui Invasive Species Committee (MISC) about invasiveness of plants: The WRA Specialist, stationed on Maui, responded to 37 plant-related calls, providing information on identification, impacts and control of invasive, non-native plants.

Other Activities in FY13

Collaboration on new database with HBIN: Progress continues to be made on development of a new, web-based HPWRA database with staff of the Hawaii Biodiversity Information Network. The new database addresses shortcomings with the current program, and will provide greater accessibility to information through enhanced query features. It is anticipated that HPWRA content, through queries, will eventually be made available to members of the general public.

Peer review of invasive species manuscripts: The WRA Specialist's expertise on invasion ecology was solicited for review of manuscripts submitted to scientific journals. From July 2012 through June 2013, peer reviews were provided for the Caribbean Journal of Science, Journal of Field Ornithology, Biotropica and Invasive Plant Science and Management.

For more information, please contact: hpwra@yahoo.com or visit hpwra.org

Title: Ballast Water and Hull Fouling Coordinator

Organization: Department of Land and Natural Resources, Division of Aquatic Resources

Award(s): \$30,547



Introduction: The mission of the Division of Aquatic Resources is to manage, conserve and restore the state’s unique aquatic resources and ecosystems for present and future generations. A key threat to Hawaii’s aquatic environment is aquatic invasive species (AIS) and DLNR has statutory responsibility for this issue. This position develops and implements policy to minimize the introduction and spread of AIS in Hawaii. The total funding need for this position and supporting work in FY13 was \$107,000. HISC provided 35% of this need.

Achievements in FY13

Deliverable 1: Continue the administration of Hawaii Administrative Rules, Chapter 13-76. Maintain compliance of incoming vessels through evaluation of ballast water reports.

Ballast water reports were regularly processed to ensure vessels arriving into Hawaii were complying with the state’s ballast water rules. The majority of vessels were compliant, with a small proportion discharging untreated ballast under safety exemptions. DAR began assessing gaps in ballast water management in Hawaii, including unmanaged ballast and verification of treated ballast. Also, the federal government introduced more stringent, numeric based ballast water standards in 2012. DLNR is considering the implications for the state’s ballast water regulations.

Deliverable 2: A risk assessment characterizing the biofouling maintenance of vessels operating in Hawaii. In early 2013 DAR reconvened the Hawaii’s Alien Aquatic Organism Task Force (AAOTF) and led the group in discussions on how to manage vessel biofouling. This included issuing formal invitations to re-engage with members and seek new members to ensure a balanced stakeholder group. The group agreed that biofouling is a major risk for aquatic invasive species introductions in Hawaii and to assist with the development of a management framework. Firstly, questionnaires were finalized, for both commercial and recreational craft, to collect information on how boat and ship owners keep their hull and niche areas clean of biofouling. Data collection began in June 2013 and to date DAR has collected 60 boater questionnaires

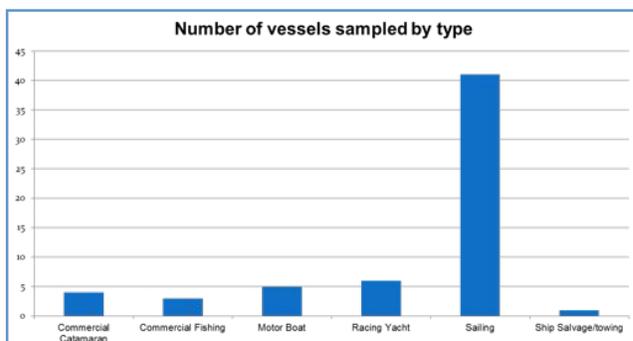


Figure 1: boater questionnaires (preliminary data)

(Figure 1). Shipper questionnaires will be collected during the rest of 2013. This information will help DLNR to understand the drivers and barriers to the uptake of management actions for biofouling. It will be used to create a draft biofouling policy for Hawaii in 2014. Another key achievement was the biofouling inspection and sampling of a passenger vessel in dry dock in Hawaii, to support ship data collection.

Deliverable 3: A draft memorandum of

understanding is prepared for collaborative work on biofouling and ballast water issues amongst the Pacific states.

Discussions on developing a MOU are still in progress and continuing. Importantly, a group of Pacific US states have begun discussing consistency in vessel biofouling management and in water cleaning management (also of vessels). These are important areas where reciprocity would be of value to resource management and for providing consistency to industry groups. There are good opportunities in the upcoming fiscal year for these discussions to materialize into a MOU.

Deliverable 4: Participate strategically in the aquatic invasive species (AIS) groups including the Pacific Ballast Water Working Group (remotely), HISC Prevention Working Group and Coordinating Group on Alien Pest Species. The coordinator participated in regular meetings of the Hawaii Invasive Species Council, the HISC Working groups, and the Coordinating Group on Alien Pest Species by giving presentations on progress and engaging with partners. The Coordinator also participated remotely in aquatic invasive species working groups from neighboring states including the California State Land's Commission Technical Advisory Group (for vessel biofouling), the Washington State's Ballast Water Working Group, and in the Coastal Subcommittee of the Western Regional Panel on Aquatic Nuisance Species. The coordinator has been invited to chair this group in 2014.

Commercial ships' biofouling questionnaire

Other Activities in FY13

Japan Tsunami Marine Debris Response: The coordinator responded to numerous reports of suspected Japan tsunami marine debris in Hawaii. This debris has emerged as a potential vector for AIS introductions in Hawaii, though it is considered an unprecedented event and the volume of debris is expected to reduce in the near future. Potential invasive species were first detected on JTMD in Hawaii in late 2012. Outreach materials explaining how to respond and why the debris poses an AIS issue was developed for the public and first responders. Next year, surveys are planned for the areas where debris has landed in Hawaii with suspect invasive species attached, to determine if there have been any species transfers.

Other stakeholder meetings:

The coordinator was also very fortunate to participate at the Australia, New Zealand and Pacific biofouling workshop on Sustainable Shipping. Key outcomes included setting up a comparative biofouling study with Western Australia, engaging with the World Ocean Council who are based in Honolulu and have added biofouling to their agenda, and engagement with Samoa on addressing biofouling of ships.



Aquatic invasive species outreach on Japan tsunami marine debris

For more information, please contact:

Sonia Gorgula, Ballast Water and Hull Fouling Coordinator (Sonia.gorgula@hawaii.gov)

VI. HISC Response & Control of Established Pests Working Group

Response and Control of Established Pests Working Group Goals

- Review priorities for the control of pests already present or recently arrived in the state
- Implement cost effective eradication and control programs against incipient and established pests with shared resources and shared responsibilities of all agencies.
- A more detailed list of goals is given in the HISC Strategy 2008-2013.

Funded Projects for FY13

The lead agency for the Response and Control of Established Pests Working Group (also referred to as simply the Established Pests Working Group) is DLNR. In FY13, the Established Pests Working Group funded eight projects, totaling \$1,136,102:

- Detection & Control of Invasive Species in Maui County: \$203,078
- O’ahu Island Invasive Species Detection and Control: \$203,078
- Hawai’i Ant Lab Core Funding: \$50,475
- Kaua’i Island Invasive Species Detection and Control: \$203,078
- Eradication of Little Fire Ants from Kaua’i: \$14,469
- Evaluating an insect agent for biological control of Christmas berry in Hawai’i: \$25,000
- Invasive Species Detection & Control on the Island of Hawai’i: \$203,078
- Big Island Deer Project: \$118,306
- Technical support of weed biocontrol research in Volcano, Hawai’i: \$22,750
- Management of Axis Deer on Maui Island: \$72,790
- KRCP Watershed Incipients: \$20,000

Key Activities in FY13

- Early detection / response activities provided by the island-based Invasive Species Committees
- Control of Little Fire Ants on Kauai property
- Total of 4 axis deer now removed from Hawaii Island
- Evaluation of potential biocontrol agents for Miconia, clidemia, and Christmas berry
- Jackson's chameleon intercepted on Kauai

Summary Data for Activities Supported by FY13 HISC Funds

Plant Detection and Control	
Acres surveyed	39,732
Acres controlled	260
Mature Plants Removed	28,599
Immature Plants Removed	74,294
Miconia mature plants removed	459
Miconia immature plants removed	28,233

Animal Detection and Control	
Acres surveyed (aerial and ground)	2,373,461
Animals detected	115
Animals controlled	112



Miconia, *Miconia calvescens*

Title: Hawai'i Ant Lab

Organization: Hawai'i Ant Lab

Award: \$85,326

Introduction:

The Hawai'i Ant Lab delivers the invasive ant strategy for the state of Hawai'i . Our mission is to:

- Protect Hawai'i from new introductions of invasive ants,
- Prevent the inter-island and intra-island spread of existing invasive ant species,
- Provide sound, practical treatment methods for homeowners, natural resource managers and industry,
- Eradicate new incursions whenever possible.



HISC supplies approximately 30% of total HAL operating funds. An additional 30% is provided by Hawai'i Department of Agriculture and the remainder is sourced from competitive grants from other sources.



The staff from Hawai'i Ant Lab (from left) Kanoë Malani, Dr Cas Vanderwoude, Michelle Montgomery and Brent Sheehan

Achievements in FY13

The Hawai'i Ant Lab (HAL) is a point-of-contact for conservation agencies, members of the public, the agricultural and nursery industries and the HISC on any matter involving identification, prevention and control of invasive ants. The HAL has maintained daily invasive ant prevention and response services throughout the past 12 months.

Operate and maintain a 24/7 telephone contact service for members of the public.

During the reporting period, 540 telephone calls and walk-in enquiries were processed by Hawai'i Ant Lab.

Provide a diagnostic service to members of the public and other conservation agencies.

Members of the public submitted for identification a total of 84 specimens. The majority of these were Little Fire Ants.

Develop, update and promote the www.littlefireants.com website

The website contains extensive information on invasive ants including a library of fact sheets and other information available for download. It has been entirely recoded during the reporting period, and in the

past 12 months, the new website had 5,179 visitors and 13,384 page views. Over 68% of these were from the state of Hawai'i. Additionally, Hawai'i Ant Lab operates and maintains a discussion group that currently has 134 members.

Conduct regular island-wide point-of-entry surveys for invasive ants.

Point of entry surveys were conducted at Hilo airport, Hilo seaport, Kona airport and Kawaihe seaport.

Produce and update "fact sheets" providing prevention advice to residents and industry.

A total of six fact sheets are available in printed form or for download from the littlefireants.com website.

Respond to requests for engagements to associations and societies and staff public displays.

Presentations have been delivered to 22 community groups with a total attendance of 871 persons. Additionally, we have begun hosting a monthly ant management clinic where participants can learn about impacts, control and disinfestation procedures. To date, three such clinics have been conducted with approximately 20 participants on each occasion. There is a waiting list for future clinics.

Work with Hawai'i County to manage Little Fire Ants in public access areas.

The Hawai'i Ant Lab and County of Hawai'i were awarded a grant from the Hawai'i Tourism Authority to mitigate impacts of Little Fire Ants in Hilo beach parks and the zoo.

Continue the Maui eradication program at Waihe'e, Maui

A.4._ Three additional treatments have been applied to eradicate a small incipient LFA colony discovered during post-eradication monitoring survey.



Examples of training workshops conducted by Hawai'i Ant Lab (from left) ant management clinic, working with staff from County of Hawai'i and an ant taxonomy training workshop in Guam

For more information, please contact:

Cas Vanderwoude
Hawai'i Ant Lab, University of Hawai'i
16 E. Lanikaula St Hilo HI. 96720
Ph: 808 989 9289
www.littlefireants.com

Title: Eradication of Little Fire Ants from Kaua'i
Organization: Hawai'i Ant Lab
Award: \$14,469

Introduction:

The Hawai'i Ant Lab delivers the invasive ant strategy for the state of Hawai'i. Our mission is to:

- Protect Hawai'i from new intentional and unintentional introductions of invasive ants,
- Prevent the inter-island and intra-island spread of existing invasive ant species,
- Provide sound, practical treatment methods for homeowners, natural resource managers and industry,
- Eradicate new incursions whenever possible.



HISC supplies approximately 30% of total HAL operating funds. An additional 30% is provided by Hawai'i Department of Agriculture and the remainder is sourced from competitive grants from other sources.

A small infestation of Little Fire Ants has been present on the island of Kaua'i for over ten years. Intensive efforts by the Kaua'i Invasive Species Committee and Hawai'i Department of Agriculture have restricted the distribution of this species to an area of approximately 12 acres near Kalihiwai, however, it has not been possible to eradicate this infestation until now. This project aims to eradicate Little Fire Ants from Kauai and prevent further spread throughout the island.

HISC provided partial funding for this project with the US Forest Service and Hawai'i Department of Agriculture also contributing. Staff from HDOA and the Kaua'i Invasive Species Committee assisted Hawai'i Ant Lab staff with survey and treatment activities.



Staff from the Kauai Invasive Species Committee applying the new gel bait high in the canopy

Achievements in FY13

This project has been immensely successful to date. Kauai Invasive Species Committee, Hawai'i Ant Lab, Hawai'i Department of Agriculture and County of Kauai have been working together to implement this plan. Of the LFA from the main infested area, only a single ant was detected during the last survey and it appears we are on-track to eradicate. Next Fiscal Year, we plan to continue monitoring and develop and execute a plan for the remaining infested area.

Deliverable 1: Delimit the infested area

Prior to beginning the eradication treatments, the entire site was intensively surveyed to identify infestation boundaries and determine the ant population density (see map below). Over 600 baiting stations were deployed in the field.

Deliverable 2: Application of treatments

A total of eight treatments were applied, one every six weeks, beginning September 2012 and completed by July 2013. This intensive treatment level was needed to ensure all ant colonies were eliminated. The newly developed HAL bait gel was applied to all vegetation over 6ft in height (including mature palm trees) and granular baits were applied to the ground in open spaces. Only three individual ants have been detected in the main infested area during the surveys conducted since February 2013.



Map showing the survey area, and include a caption in this box – (source Kauai Invasive Species Committee).

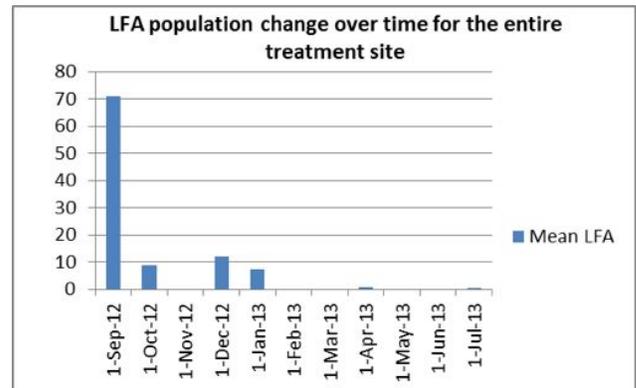


Figure showing changes in ant population through the treatment phase.

Deliverable 3: Post-eradication monitoring

Monitoring and eliminating remnant colonies will need to continue for another three years. The first monitoring survey was conducted in July 2013; only a single ant was detected with this survey.

For more information, please contact:

Cas Vanderwoude
Hawai'i Ant Lab, University of Hawai'i
16 E. Lanikaula St Hilo HI. 96720
Ph: 808 989 9289
www.littlefireants.com

Title: KRCP Watershed Incipients

Organization: KRCP/Garden Island Resource Conservation & Development Inc.

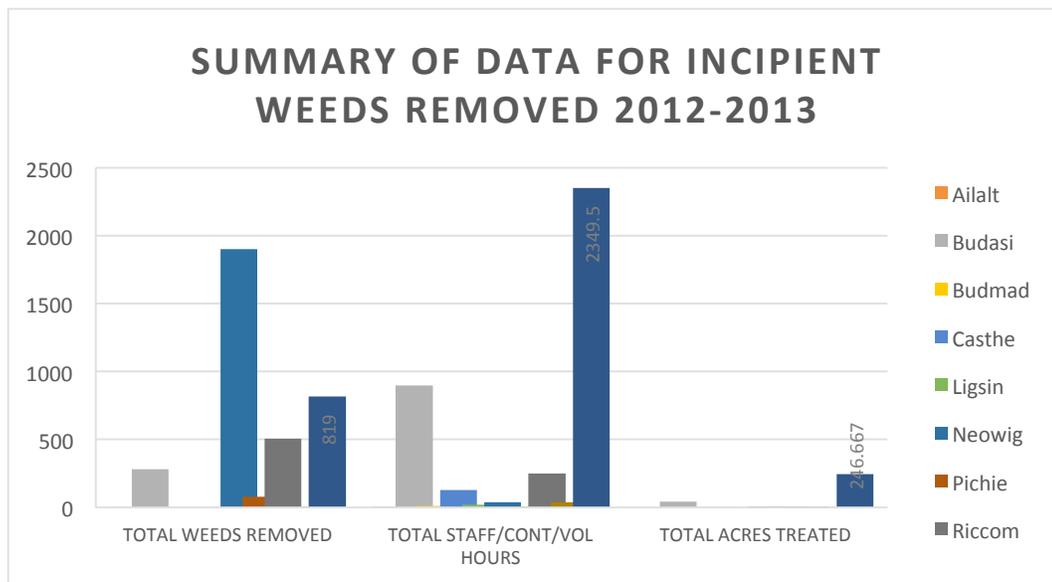
Award: \$20,000



Introduction: Garden Island Resource Conservation & Development (GIRC&D), Inc. is a community-based 501(c)3 nonprofit whose mission is to prudently use natural and human resources to improve Kaua'i county's environment, economy and social fabric. Kōke'e Resource Conservation Program (KRCP) is a project of GIRC&D and its mission is to involve the public in protecting Kaua'i's diverse forest ecosystems by coordinating volunteers in service learning projects to conduct invasive weed removal in selected areas of northwestern Kaua'i. We also benefit from interagency coordination to function as a rapid response weed control service for the Koke'e region. Our total budget for 2013 is \$222,000. HISC provided 9% of this amount.

Achievements in FY13

Deliverable 1 is the quantitative summary of weed control activities: KRCP transected a total of 120 acres: 40 were first pass for suppression and 80 were second pass for maintenance. A total of 3,067 weeds were treated with 332 staff hours, 1207 volunteer hours and 66.5 contributed labor hours. This work contributes to protecting as many as 20,000 ecosystem acres due to Kōke'e's location being a major public access to the Alaka'i and other surrounding forest reserves, and the nature of spreading of these weeds. Our latest control effort on the new incipient Hawkweed (first island record) showed a 85 % decrease from the first pass.



Deliverable 2 is the number of partner interactions that occurred and the importance of public relations. KRCP's work benefitted from 66.5 hours of contributed labor from partners including National Tropical Botanical Garden, The Nature Conservancy, Plant Extinction Prevention Program, and Coordinating Group on Alien Pest Species. Many visiting scientists and various organizations have consulted us about our weed control methods. Kōke'e's leaseholders and hunters are more vigilant about invasive weeds and native plants. We educated

and trained six (6) interns and some 165 volunteers who gained worked with other agencies and experienced hands-on resource management in the forest. Our public relations exposure continues to grow at the Banana Poka forest education fair at Kōke'e. In partnership with KISC, we had a presence at the Garden Fair, Arbor Day and Kaua'i Farm Bureau Fair. We also had a presence at the 2013 Hawaii Conservation Conference held this summer on O'ahu. Through these public events we were able to provide educational outreach on invasive weed species to an indeterminate amount of people both on and off island. Our website and blog provide additional exposure and interaction.



KRCP summer intern, Keali'i Serrano, prepares to hand saw a large Australian Tree Fern.

Deliverable 3 is taking advantage of historical resources for determining risk assessment. We have been conferring with a leaseholder knowledgeable in Kōke'e's vegetation history to determine the invasiveness of *Camelia sinense* based on its time and places of original plantings in Koke'e and its current spread. It's considered very invasive in some ecosystems in the world. We are also exploring the possibility of controlling it by cutting, processing and selling it as a wild-grown tea, and thus providing additional income to our program.

Additional Information

Over the past few years, we had noticed that the deer were eating one of our major incipients: privet (*Ligustrum sinense*). Initially it seemed like the deer might keep the privet under control. However, a leaseholder alerted us to the fact that the deer population has dropped drastically in one area of the park and that the privet is taking off again. We are assessing this situation.

For more information, please contact: Katie Cassel, rcp@aloha.net, 808-335-0045.

Title: Big Island Axis Deer Project
Organization: Big Island Invasive Species Committee
Award(s): \$118,306



Introduction: The Big Island Axis Deer Project was formed under the Big Island Invasive Species Committee in 2011. The project is a partnership with input from the DLNR Division of Forestry and Wildlife, The Nature Conservancy, the US Fish and Wildlife Service, and other organizations. The mission of this project is to eradicate axis deer from Hawai'i Island.

Achievements in FY13

Deliverable 1: Dispatch 100% of the deer confirmed by BIISC staff.

MOE: Evaluating the number of deer dispatched relative to the number of confirmed deer sightings.

- To date 100% of the deer confirmed by BIISC staff have been dispatched (4).

Deliverable 2: Continued support from current partners; building new partnerships to increase the capacity of the project; and organizing at least twelve partner operations per year utilizing skilled, appropriate partner staffing.

MOE: Documented activities with current and new partners.

- BIISC continues to maintain and foster relationships with the Hawaii Department of Land and Natural Resources, Hawaii Department of Agriculture, National Park Service, Three Mountain Alliance, Kohala Watershed Partnership, The Nature Conservancy, Hawaii Cattlemen's Association and numerous private landowners and other local groups.
- BIISC has developed new relationships with numerous entities including equipment use agreements and memorandums of understanding for staff assistance.
- BIISC organized and executed 14 partners operations in the reporting period, which resulted in approx. 1,370 hrs of contributed time by partnered staff.



The Axis Deer Team preparing for an early morning FLIR Aerial Survey

Deliverable 3: Outreach activities targeted to increase frequency and reliability of axis deer sightings on the Big Island.

MOE: Outreach materials produced; number of outreach activities; number of people reached; number and reliability of sightings.

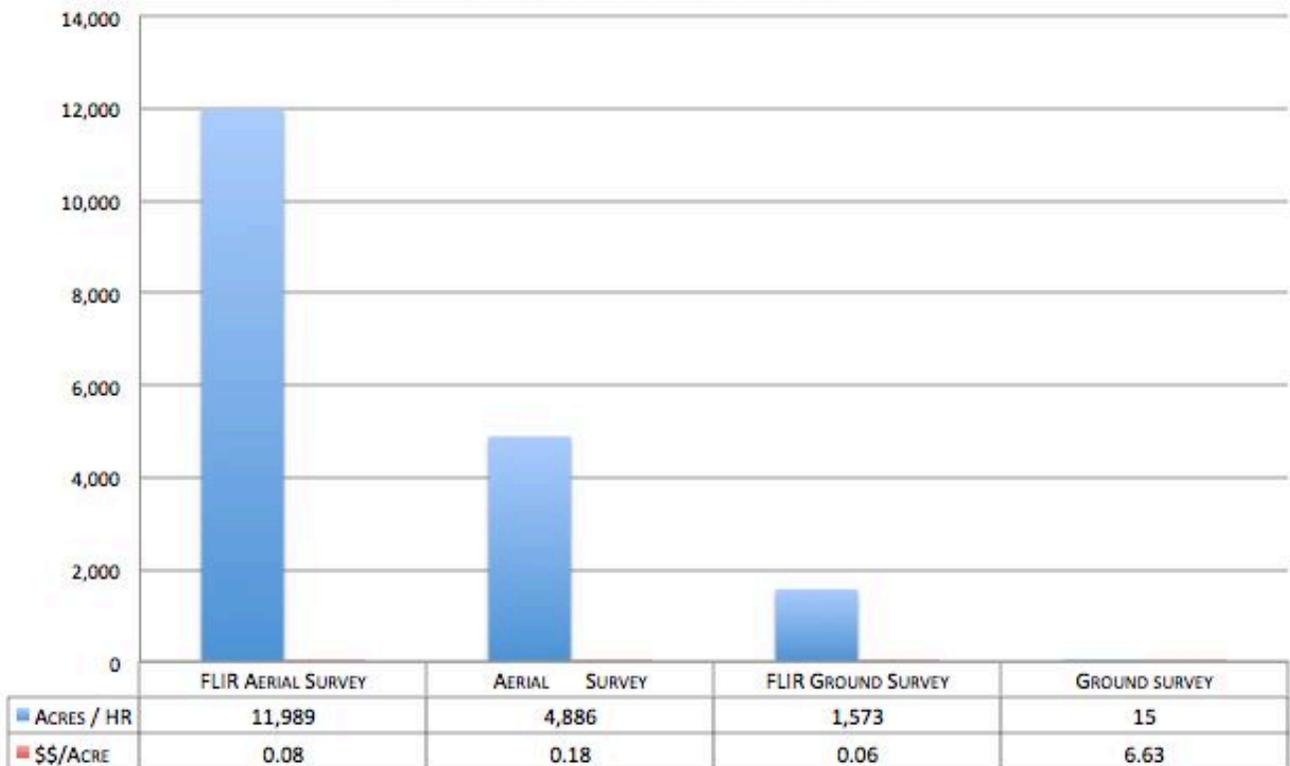
- Throughout the reporting period BIISC staff have seen an increase in the reliability of axis deer sightings in conjunction with a decrease in the number of sightings. An ideal result to outreach efforts.
- BIISC staff delivered targeted messages via direct mail, email, posters, and attendance at community events.
- If you combined information sent by direct mail, email, visibility of posted information and booth visits we could estimate our current audience at 35,000.

Deliverable 4: Innovate and improve methods for detection and control of feral ungulates.

MOE: New techniques and technologies used during the reporting period.

- BIISC staff continues to refine and incorporate the use of Forward Looking Infrared (FLIR) into both ground and aerial operations.
- BIISC staff improved aerial FLIR survey techniques, which has resulted in increased detection rates for remnant ungulate populations.
- BIISC staff pioneered the use of Satellite Telemetry video collars to test and measure the effectiveness of axis deer as a Judas Animal.
- BIISC staff conducted the first ever ACETA FLIR assisted aerial shoot, which resulted in a significant increase in dispatch efficiency and effectiveness.
- BIISC staff conducted 124 hrs of nocturnal behavioral study utilizing FLIR technology to investigate axis deer responses to control stimuli.

Field Methodology Comparison



A comparative look at the primary field methodologies used by BIISC deer staff. It is evident that the use of FLIR technology significantly increases field and cost effectiveness per acre.

Other Activities in FY13

Activity 1: BIISC participated in multiple training exercises during the reporting period. The goal of the cooperative training exercises was to introduce partner staff to FLIR technology and its field applications as well as create scenarios to improve skill level for BIISC deer staff.

Activity 2: Parties involved in the transport of deer from Maui to the Big Island were prosecuted and charged. As a part of their restitution 500 hours of community service in the form of helicopter time

were donated to Invasive Species work across Maui and Hawaii County. The primary purpose of the hours was to survey for established deer populations on the Big Island.

Activity 3: Due in part to funds provided by HISC the BIISC deer team was able to hire its third full time employee. The additional staff has significantly increased both field and outreach effectiveness.

Activity 4: During the reporting period BIISC staff started collecting data and information from its relevant partners to assist the development of a long term strategic plan for control and monitoring.

Additional Information

Axis deer present a huge threat to agriculture, watershed health, and human safety on the Big Island. Current estimates for axis deer are low and decreasing indicating that there is a narrow window of opportunity to prevent the economic and ecological damage already suffered by neighboring islands where deer populations may no longer be eradicated. The goal of this project is to support the estimated seven-year campaign to eradicate axis deer from the island. The proposed approach requires use of trained and certified project and partner staff, strong commitment and support from partner agencies, businesses, local farmers and ranchers, and an effective and comprehensive outreach program. Project activities will focus on continued survey and control operations, partner participation, stakeholder engagement and outreach.



Pictured above is a BIISC staff member with the fourth axis deer removed from the Big Island

For more information, please contact:

Springer Kaye
Manager
Big Island Invasive Species Committee
23 E Kawili St
Hilo, HI 96720
808-933-3340

Title: Management of Axis Deer on Maui Island

Organization: Maui Axis Deer Working Group

Award(s): \$72,790

Introduction: Axis deer (*Axis axis*) were first introduced to Maui in 1959. The population has since grown and spread across the island. Farmers and ranchers have reported major crop and forage damage. Maui's forested watersheds suffer from deer browsing and rubbing. Axis deer pose an increasing risk to residents and tourists due to deer-vehicle collisions and present a safety hazard to residents due to increased poaching activities. The Maui Axis Deer Working Group (MADWG), comprised of local farmers, ranchers, state and local agency personnel, tourist industry representatives, and hunters, formed in October 2010 to address the axis deer problem on Maui. A comprehensive plan was created with an overarching goal of initiating effective axis deer management to reduce negative impacts. A key recommendation was to hire a coordinator. In May 2013, a full-time coordinator began working to implement the Management Plan. Funds from the Hawai'i Invasive Species Council provided approximately 75% of total funding for FY13, with the remaining support from the County of Maui.

Achievements in FY13

Deliverable 1: Determine current axis deer population status on Maui. Work focused on the following objectives of the Management Plan:

- *Work with University of Hawai'i or non-governmental agencies on development of population models. Develop appropriate measures to track population trends. Assess and monitor axis deer population using scientifically-based methods.* Extensive research was conducted to determine the best approach for determining population levels. Specific activities included: comprehensive literature searches in wildlife management journals and consultations with Hawai'i and mainland wildlife biologists at the following institutions: U.S. Geological Survey, Hawai'i Department of Land and Natural Resources (DLNR), University of Hawai'i, University of Arizona, and Brigham Young University. The preferred design includes aerial surveys using "distance sampling" methodology; ground-based surveys; and collection of data using radio collars to generate information on survival and mortality. A series of aerial surveys (14 survey hours plus a 3-hour operational test flight) was conducted across portions of Upcountry, South and West Maui. Transect lines were predetermined using ArcGIS. Three counters in the helicopter recorded all deer observed using voice recorders; estimated distance from the helicopter using range finders; and recorded geospatial data for transect lines flown. Data analysis will be completed by December 2013 with additional surveys continuing beyond this reporting period.
- *Consult with state agencies to assess relevance and availability of axis deer data.* An open dialogue has been established with stakeholders and DLNR representatives to gather harvest data and other mortality records for inclusion in the population analysis. The Coordinator met with DLNR wildlife staff to review availability of data from previous axis deer aerial surveys, wildlife control permits, and harvest data, and also met with managers of Maui's large ranches to obtain information about number of deer harvested.

Deliverable 2: Identify Management Focus Areas (MFAs) based on landscape, human population density, land use, conservation value, legal control options, and deer control / harvest history.

Meetings with stakeholders and State biologists helped clarify management goals and objectives for different areas on Maui. The delineation of Management Focus Areas is in development but necessarily depends on collation of data from various sectors, which is ongoing.

Deliverable 3: Increase public understanding of deer biology and impacts of an unmanaged population on human health, agriculture, tourism, and forest health. Two newspaper articles on axis deer were

published in the Maui News reaching an estimated audience of 22,000 readers. An article in Maui No Ka Oi magazine (circulation of 25,000) highlighted challenges and potential solutions. The Maui Huliau Foundation, which works with local middle and high school students to produce and edit environmental videos, selected the deer management program as an upcoming student film project. The Coordinator will continue working with the students to create a short video; it is expected to have a local premiere and will be broadcast on the local cable station. Information about the Management Plan was shared at the Olinda Community Association (attended by 25 people) and the Coordinator has met with local residents expressing concerns related to deer hunting near homes.

Other Activities in FY13

The following additional activities addressed specific objectives outlined in the HISC Strategic Plan.

Other activity 1: Support development of management plans for widespread vertebrate pests. In June 2013, the MADWG helped organize a meeting of Hawai'i wildlife and invasive species experts. In addition to reviewing current methods used for ungulate aerial population assessments, the group identified research needs relating to ungulates in Hawai'i and committed to continuing to meet as an *ad hoc* group. Issues identified for future work included: summarizing previous population estimates and current techniques for ungulate management in Hawai'i; considering carrying capacity for ungulates on different islands; summarizing what is known about ungulate parasites; data standardization; identifying priority needs; mapping current ranges of different species; and identifying previous studies that could be published as technical reports. A follow-up meeting held in July 2013 at the Hawai'i Conservation Conference began compiling a list of ungulate species and status on each island. This statewide working group on ungulates is expected to provide an informal network of experts that can help support management of ungulates across the islands.

Other activity 2: Coordinate with counties to increase resources and funding to address county-sponsored activities involving invasive species: Maui County continues to show a strong commitment to addressing the axis deer issue. Participants in plan development included: the Maui County Mayor, Maui County Environmental Coordinator, Office of Economic Development Agricultural Specialist, and Council Members. The Maui County Office of Economic Development committed resources in both FY13 and FY14 to help ensure the success of the project. Maui County is also supporting efforts by the separate Maui Axis Deer Harvest Cooperative, which has begun removing axis deer from Upcountry private residences. An estimated 400 deer have been removed under this project.

Additional Information

Aerial surveys were able to make use of no-cost helicopter services arising from the U.S. Fish & Wildlife Service case against the illegal transport of axis deer from Maui to Hawai'i Island. This option will not be available for future surveys. County funding will help address part but not all this operational gap for FY14. The Maui Axis Deer Project is a project of Pacific Cooperative Studies Unit (University of Hawai'i).

For more information, please contact:

Kanalu Sproat
Maui Axis Deer Program Coordinator
kanaluks@hawaii.edu
(808) 495-5539

Title: Evaluating an insect agent for biological control of Christmas berry (*Schinus terebinthifolius*) in Hawai`i

Organizations: USDA Forest Service, USDA Agricultural Research Service

Award: \$25,000



Pseudophilothrips ichini larvae and adults feed on Christmas berry stems and leaves

Introduction: The USDA Forest Service Institute of Pacific Islands Forestry researches natural enemies of invasive plants for their potential use in management of Hawaiian forest weeds. We were awarded funds by HISC and the Hawaii Watershed Partnerships Program for host specificity testing of a potential natural enemy for Christmas berry (*Schinus terebinthifolius*). Christmas berry is a major pest of mesic ranchland, natural areas and archaeological sites, and a high priority target for biological control in Hawai`i. Dr. Gregory Wheeler of the USDA-ARS Invasive Plant Research Laboratory (IPRL) in Fort Lauderdale, Florida has been contracted to test a Brazilian thrips insect, *Pseudophilothrips ichini*, to determine if it will be safe for release in Hawai`i for control of Christmas berry (also called Brazilian pepper in Florida). The IPRL is testing approximately 35 species of crop plants, native plants and culturally important plants that occur in Hawai`i, mostly within the order Sapindales, to which Christmas berry belongs.

Achievements in FY13

Feeding and reproduction of the *P. ichini* thrips has been evaluated on 29 plant species of importance to Hawai`i, and most tests are complete with 4 or 5 replicate plants tested (Table 1). The test plant list includes the closest relatives of the weed that occur in Hawai`i. Tests are under no-choice conditions (insects faced with starvation): 20 adult thrips are allowed to feed and reproduce on each test plant, and the next generation of adults are counted. Our results indicate that, besides the weed *S. terebinthifolius*, no adults were produced on exposed test plant species, with one exception on the species *Dodonaea viscosa*, where there was a low level of reproduction on one of the replicate plants (Table 1).

To examine this result under circumstances with greater ecological relevance, we conducted a choice test where the adults were provided simultaneously both the weed and *D. viscosa*. Additionally we tested in a choice test the only Hawaiian native species of Anacardiaceae, *Rhus sandwicensis*, as this familial relative is expected to be the most vulnerable. Our results to date indicate that when the thrips have a choice, they reproduce on the weed but not on the non-target species (Table 2). This choice test is still in progress with additional replicates.

Additional plant species are still needed to complete the testing (Table 3). These species are not available on the mainland US so we are working to ship seeds or cuttings from sources in Hawai`i.



Quarantine testing at IPRL in Florida with Hawaiian plant species: no-choice (starvation) tests with the thrips,



Pseudophilothrips ichini adults feed on and kill Christmas berry leaf tips.

Table 1. Plant species tested in No Choice bioassays to determine the safety of the thrips, *Pseudophilothrips ichini*

Order	Family	Species	Number of Replicates	Mean F1 Adults
Sapindales	Anacardiaceae	<i>Schinus terebinthifolius</i>	36	136
Sapindales	Anacardiaceae	<i>Rhus sandwicensis</i>	4	0
Sapindales	Anacardiaceae	<i>Mangifera indica</i> (common mango)	2	0
Sapindales	Anacardiaceae	<i>Mangifera indica</i> (Ice Cream)	2	0
Sapindales	Anacardiaceae	<i>Mangifera indica</i> (Carrie)	5	0
Sapindales	Anacardiaceae	<i>Mangifera indica</i> (Haden)	5	0
Sapindales	Meliaceae	<i>Azadirachta indica</i> (neem)	4	0
Sapindales	Meliaceae	<i>Entandrophragma caudatum</i>	4	0
Sapindales	Meliaceae	<i>Sandoricum koetjape</i>	4	0
Sapindales	Meliaceae	<i>Swietenia mahogany</i>	4	0
Sapindales	Meliaceae	<i>Swietenia macrophylla</i>	4	0
Sapindales	Meliaceae	<i>Toona ciliata</i> #1	1 ^a	0
Sapindales	Rutaceae	<i>Casimiroa edulis</i> (Redlands)	4	0
Sapindales	Rutaceae	<i>Citrofortunella microcarpa</i>	4	0
Sapindales	Rutaceae	<i>Flindersia brayleyana</i>	4	0
Sapindales	Rutaceae	<i>Murraya paniculata</i>	1 ^a	0
Sapindales	Rutaceae	<i>Zanthoxylum fagara</i>	4	0
Sapindales	Sapindaceae	<i>Dimocarpus Longan/Biew Kieuw</i>	4	0
Sapindales	Sapindaceae	<i>Dodonaea viscosa</i>	5	1 ^b
Sapindales	Sapindaceae	<i>Filicium decipiens</i>	4	0
Sapindales	Sapindaceae	<i>Harpullia pendula</i>	4	0
Sapindales	Sapindaceae	<i>Majidea zanguebarica</i>	4	0
Sapindales	Sapindaceae	<i>Sapindus oahuensis</i>	2 ^a	0
Sapindales	Sapindaceae	<i>Sapindus saponaria</i>	4	0
Sapindales	Zygophyllaceae	<i>Guaiacum sanctum</i>	4	0
Sapindales	Zygophyllaceae	<i>Tribulus cistoides</i>	4	0
Fabales	Fabaceae	<i>Acacia koa</i>	4	0
Fabales	Fabaceae	<i>Sophora chrysophylla</i>	4	0
Myrtales	Myrtaceae	<i>Metrosideros polymorpha</i> (ohi'a)	4	0

^a Additional replicates still in progress

^b 1 rep had 5 adults

Table. 2. Plant species tested in Choice bioassays to determine the safety of the thrips, *Pseudophilothrips ichini*

Order	Family	Species	Reps	Reps Larvae Present	Mean F1 Adults
Sapindales	Anacardiaceae	<i>Schinus terebinthifolius</i>	5	5	34.4
Sapindales	Anacardiaceae	<i>Rhus sandwicensis</i>	2 (1 complete, 1 in progress)	1	0
Sapindales	Sapindaceae	<i>Dodonaea viscosa</i>	3 (2 in progress)	0	0

Table. 3. Plant species still needed for testing to determine the safety of the thrips, *Pseudophilothrips ichini*

Order	Family	Species	Number needed to complete testing	Comments
Sapindales	Meliaceae	<i>Aglaia odorata</i>	4	Plants treated with pesticide
Sapindales	Meliaceae	<i>Cedrela odorata</i>	4	
Sapindales	Meliaceae	<i>Khaya</i>	4	
Sapindales	Meliaceae	<i>Lansium domesticum</i>	4	Plants too small
Sapindales	Meliaceae	<i>Toona ciliata</i>	3	
Sapindales	Rutaceae	<i>Fortunella/Citrus japonicum</i>	3	Testing now
Sapindales	Rutaceae	<i>Melicope spp.</i>	4	Seedlings did not transplant well
Sapindales	Rutaceae	<i>Platydesma spp.</i>	4	
Sapindales	Sapindaceae	<i>Alectryon sp.</i>	4	
Sapindales	Sapindaceae	<i>Koelreuteria elegans</i>	4	Plants too small
Sapindales	Sapindaceae	<i>Nephelium ranboutan-aka</i>	4	Have one or two small plants
Sapindales	Sapindaceae	<i>Sapindus oahuensis</i>	1	
Cyatheales	Cibotiaceae	<i>Cibotium sp.</i>	4	
Ericales	Sapotaceae	<i>Planchonella sandwicensis</i>	4	Plants too small
Lamiales	Myoporaceae	<i>Myoporum sandwicensis</i>	4	

Title: Technical Support of Weed Biocontrol Research in Volcano, Hawaii

Organization: USDA Forest Service

Award: \$45,500

Introduction: The USDA Forest Service Institute of Pacific Islands Forestry researches natural enemies of invasive plants for their potential use in management of Hawaiian forest weeds. *Miconia calvescens* has been a high priority target of our work over the last 13 years, including exploratory studies in Costa Rica and Brazil and host specificity testing of selected agents in our Volcano quarantine facility. Collaborating with the Hawaii Department of Agriculture, we also have released a promising biocontrol for strawberry guava and begun detailed post-release monitoring. USFS base funding for this program is roughly \$250K per year; and this HISC award represents approximately 15% of our total funds over the last year.

Achievements in FY13

Miconia biocontrol: This year we have begun detailed host specificity testing of *Euselasia chrysippe*, a butterfly whose larvae defoliate miconia leaves (Figure 1). This potential biocontrol agent has been well-studied in its Costa Rican native range but remains challenging to rear in captivity. Our work therefore has focused on tests with field-collected larvae, both in Costa Rica and with insects imported to our Volcano quarantine facility. Results so far indicate that larvae are adapted to feed on a broad range of melastomes, but not on species outside this plant family (Figure 2). Melastomes in Hawaii include miconia, clidemia and other invasive alien species, but no native plants. Our findings support the expectation that this butterfly would use only miconia and perhaps a few other weeds here, without affecting any native or otherwise valued species.



Figure 1. *Euselasia chrysippe* larvae feed on miconia leaf.

Strawberry guava biocontrol: The Brazilian scale insect *Tectococcus ovatus* was released in demonstration plots at two sites on Hawaii Island during 2012. Populations are established and growing, with insects spreading gradually within individual trees. These sites are serving to demonstrate the impacts and specificity of the biocontrol agent, which will next be released within native forest sites to slow the spread of strawberry guava. (Attached: summary presented as poster at the 2013 Hawaii Conservation Conference)

Additional Information

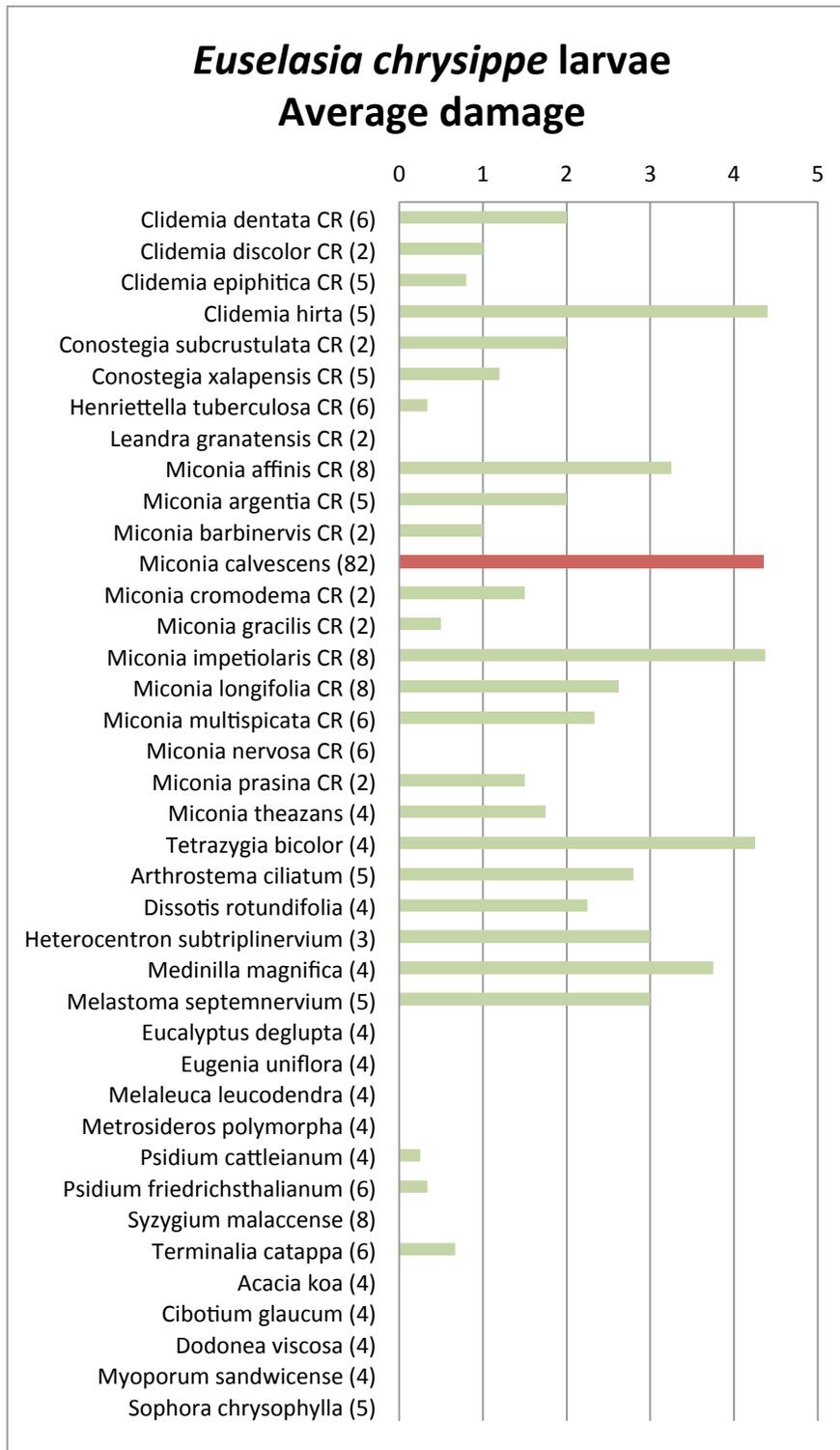


Figure 2. Feeding damage by *Euselasia chrysippe* larvae in 3-day, no-choice tests (scale from 0=no damage to 5=severe damage). Number of replicates of each plant species is indicated in parentheses.



Update on Establishment of a Biocontrol Agent Released for Strawberry Guava in Hawai'i

Nancy Chaney & M. Tracy Johnson
 USDA Forest Service, Pacific Southwest Research Station, Institute of Pacific Islands Forestry

Strawberry Guava in Hawai'i

The Brazilian tree *Psidium cattleianum* (strawberry guava) is one of the worst invasive weeds in Hawai'i. Spread by pigs and alien birds, its fruit also serves as a host for pest fruit flies. Over the two centuries since its introduction, strawberry guava has invaded and degraded many tens of thousands of acres of native forest and agricultural lands. Widespread at low and mid elevations, it is now expanding its populations into our high elevation rainforest watersheds.

Strawberry guava's natural enemy *Tectococcus ovatus* is native to southern Brazil. This insect is highly host-specific, using only strawberry guava and its close relative *Psidium spathulatum*, which occurs only in Brazil. This insect has never been recorded as a pest of any agricultural or ornamental plants, and has never attacked common guava which grows throughout its native range. Extensive testing in Brazil, Hawai'i and Florida has demonstrated that this biocontrol agent will affect only strawberry guava in Hawai'i.

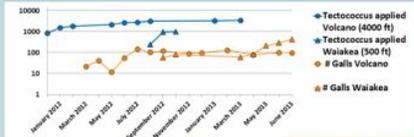
Expected Impacts of Biocontrol
Tectococcus produces galls on young leaves; existing wood will not be affected. Trees will NOT be killed, but should grow more slowly. Seed and fruit production is expected to decrease gradually. Low dispersal ability limits this insect's potential to reach backyard trees far from forests.

Initial application of *Tectococcus* using Direct Transfer Method





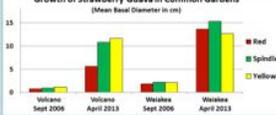
Gall Development at Release Sites



Release sites are in Volcano (4000 ft) and Waiakea (500 ft). Biocontrol release plots are paired with untreated plots to measure impacts on growth and reproduction over time. Plots include three varieties of strawberry guava found in Hawai'i: Red, Yellow and Spindle fruited. The biocontrol has increased much more rapidly at the warmer Waiakea site, where the trees also grow faster. In half the time and with lower release effort compared to Volcano, insect populations at Waiakea have increased to several hundred galls. In addition to cool temperatures, vag-induced leaf drop has delayed spread of the insect at the Volcano site.



Galls spreading within tree at Waiakea



Growth of Strawberry Guava in Common Gardens (Mean Basal Diameter in cm)

Passive Transfer Method for applying *Tectococcus*

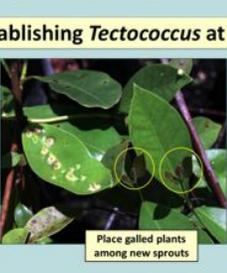
Tested at Waiakea site beginning April 2013





Method for establishing *Tectococcus* at future field sites






Many thanks to Eddie Buñil and Lori Bothwell for assistance at field sites!

For more information, please contact: Tracy Johnson, tracyjohnson@fs.fed.us

Title: Kaua'i Island Invasive Species Detection & Control
Organization: Kaua'i Invasive Species Committee
Award: \$203,078



Introduction: The continued introduction and spread of unwanted pest and invasive organisms harms our economy, water supply, native bio-diversity, health, and the lifestyle and culture unique to this island. The Kaua'i Invasive Species Committee (KISC) is a voluntary partnership of government, private, non-profit organizations, and individuals working together to: prevent the introduction of potentially damaging pest species to the island, eliminate recently arrived (incipient) pests before they spread beyond control, manage established pests in order to reduce their negative impacts, and educate and involve the public as to the magnitude of the invasive species problem and the need for control programs such as KISC. KISC works in partnership with existing programs and aims to assist in the coordination of efforts island-wide. KISC's priorities are those species that are recognized as having the greatest potential to harm human welfare and native biodiversity, and where the use of limited resources is most likely to be successful.

KISC estimates that its FY13 total funding need exceeded \$900,000. Although KISC's annual funding fell far short of this need, HISC provided approximately 37% of KISC's acquired FY13 funding.

Achievements in FY13

Early detection: Number of species detected and evaluated for feasibility of eradication:

Early detection of incipient invasive species included roadside surveys, private property surveys, as well as surveys at nurseries, ports, green-waste areas and resorts.

- Two species were surveyed for feasibility of eradication with over 28 acres surveyed.
- One species, *Cissus verticillata* (seasonvine), as a step in analyzing feasibility of eradication, is undergoing herbicide trials. Over 12 acres were surveyed, over 200 plants treated, and over 40 person hours expended on this potential target.
- Little fire ant surveys were conducted island-wide covering 180 acres with no new introductions detected.



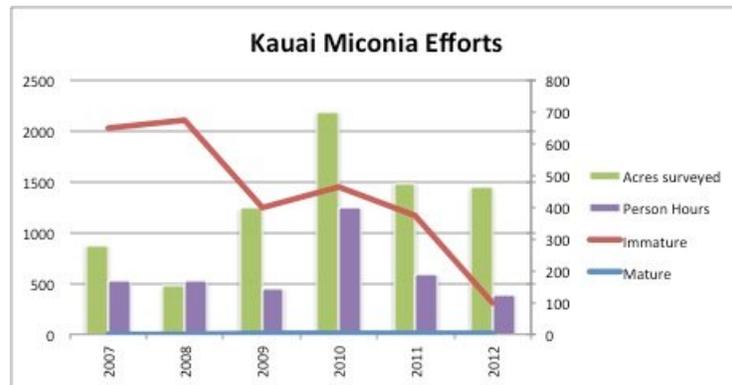
KISC crewmember with found miconia plant

Priority target species: Number and area of priority invasive species eradicated and/or controlled:

Control and eradication efforts centered on 7 priority plant species and two vertebrate species, coqui frog, little fire ant and mongoose.

- Survey and control of Miconia was focused on three primary areas of the Wailua District; Wailua River State Park (WRSP), Wailua Homesteads, and the Game Management Area (GMA) in the Halele'a Forest Reserve. 1,013 acres were ground surveyed and 138 immature plants treated. Quarterly aerial surveys were also conducted in the GMA utilizing Herbicide Ballistic Technology. Fifteen immature plants were discovered and treated from the air. Eradication strategies dictate the importance of removing plants before reaching maturity; current data suggests that these strategies are working, as no mature plants were detected.

- Other priority plant targets included Arundo, ivy gourd, false kava, long thorn kiawe, and other miscellaneous species. Over 1,283 acres were surveyed and over 6,244 individual plants were treated.
- KISC assisted HDOA and the Hawaii Ant Lab with eradication efforts at Kauai's one little fire ant infestation site in Kalihiwai. Over 119 acres were treated utilizing over 1,050 person hours.
- In collaboration with DLNR Division of Forestry and Wildlife, KISC utilized over 2,000 person-hours conducting mongoose detection and response. No mongooses were captured during this fiscal year.
- KISC continues to assist HDOA with coqui response and survey on Kauai. Over 230 acres were surveyed at high-risk areas as well as responding to calling frogs. Only one coqui was detected and captured during this period.



Kaua'i miconia efforts show a declining trend, even with sustained acres surveyed

Rapid Response: Number of new island introductions responded to and dispatched: KISC's ability to quickly respond to reports of new invasive introductions helps to prevent establishment and unchecked invasion.

- In collaboration with HDOA, KISC was able to survey for and quickly apprehend a male Jackson's chameleon reported in the Lihue area.
- During the Christmas season, KISC also assisted HDOA by retrieving two Pacific Chorus frogs that had hitchhiked on trees from Oregon.

Recognitions and Awards: During FY2013, KISC was recognized with the award of "Greatest Hits of 2012" from the Hawaii Invasive Species Council in recognition of Kauai's first capture of a live mongoose and for partnership development. This award was followed up on Kauai County with a proclamation from Mayor Carvalho recognizing KISC's accomplishments and declaring an Invasive Species Awareness Week.

Other Activities in FY13

Capacity development: Overall staff capacity was enhanced by participating in the following training events: CPR & 1st Aid classes and certification, Basic Aviation Safety Training, and Wildlife Diseases.

Partner collaboration: KISC continued to work closely during FY2013 with the Pacific Missile Range Facility, UH-CTAHR, DLNR-DOFAW, The Nature Conservancy, Hawai'i Department of Agriculture, US Department of Agriculture, and US Fish and Wildlife Service.

For more information, please contact: Keren Gundersen, KISC Project Manager, kgunder@hawaii.edu 808-821-1490, www.kauaiisc.org.

Title: O'ahu Island Invasive Species Detection & Control
Organization: O'ahu Invasive Species Committee
Award: \$203,078



Introduction: The O'ahu Invasive Species Committee (OISC) is a voluntary partnership of private, governmental and non-profit organizations, and individuals united to prevent new invasive species infestations on the island of O'ahu, to eradicate incipient species, and to stop established species from spreading. OISC helps protect a wide range of environments by targeting selected invasive species for island-wide or localized eradication. In FY2013, OISC's total funding need was \$1.3 million. OISC secured 63% of this need. HISC funding comprised 28.35% of OISC's budget funding and the remainder was leveraged with private, federal and other state sources.

Achievements in FY13

Deliverable 1: Survey 1200 acres for Miconia.

OISC's primary priority target species is miconia because of the severe consequences that an established population would have on the watershed health of the island. Miconia forms dense, monotypic stands in Hawaiian forests. Its rapid growth and large leaf habit create a closed forest canopy that would reduce native and non-invasive plant regeneration. Once it eliminates the understory, miconia's extremely shallow root system promotes large-scale erosion events that decreases aquifers recharge ability, increases the sediment load in streams and on coral reefs and reduces the regenerative abilities of forest species. OISC's field crew surveyed 2,468 acres and removed 2 mature and 1376 immature miconia (*Miconia calvescens*) trees from the southern Ko'olau Range, preventing this species from expanding into O'ahu's watersheds.



OISC crewmember controlling a large mature Miconia in Manoa Valley August 2013

Deliverable 2: Survey Ha'ikū Valley for Pampas grass.

OISC has been working with property owners to systematically remove pampas grass from the urban and residential areas and has removed 620 plants from over 45 different residence and business on O'ahu. OISC's work in this area proved to be essential after pampas grass was seen naturalized in Kīpapa and Ha'ikū Valley. OISC controlled these naturalized populations and conducted delimiting surveys to ensure there were no other mature plants in the vicinity. The time taken to remove this grass from cultivation was essential, as the potential for this species to reinvade was drastically reduced since so many had been removed from cultivation. OISC conducted surveys over 168 acres for Pampas grass and controlled 1 plant. Surveys in Ha'ikū Valley covered 157 acres.

Deliverable 3: Survey 52 acres in Palolo Valley for Himalayan blackberry.

Removed 734 Himalayan blackberry (*Rubus discolor*) plants over 39 acres in Pālolo Valley. The infestation area is in the transition zone between disturbed and mostly native forest. OISC's work here protects the native forests at the summit of the Ko'olau Mountain Range.

Deliverable 4: Control 8.6-acre infestation of Cape Ivy.

Completed delimitating the population distribution of O'ahu's only known infestation of Cape Ivy (*Delairea odorata*) located in the mid-elevation forest of the Wai'anae Mountains. Delimitating surveys

were conducted over 48 acres and 15 acres of Cape Ivy were treated. This species is controlled twice a year.

Deliverable 5: Survey 100 acres for Spiked Pepper.

In partnership with Waimea Botanical Garden, OISC conducted surveys and control for Spiked pepper (*Piper aduncum*). The species has been removed from Waimea's plant collection. OISC conducted surveys over the grounds to control plants that have spread from the original display.



OISC's field crew looking for Spiked pepper in Waimea Botanical garden

Deliverable 6: Collaborate with HDOA to conduct survey and control of Coqui frog. Work with nurseries to implement best management practices to reduce Coqui frog.

OISC's pest response technician assisted the lead agency for Coqui frog control, the Hawaii Department of Agriculture (HDOA), to control 4 coqui frogs on O'ahu. OISC has been unable to work with nurseries to implement BMP's to reduce coqui frog because HDOA is the lead agency for this species and therefore better suited to complete this project.

Deliverable 7: Conduct early detection surveys for Little Fire Ant in new landscaping.

Little fire ant (*Wasmannia auropunctata*) has been detected on the islands of Kauai, Hawaii and Maui. OISC's pest response technician conducts early detection surveys for city parks, landscaped areas, and military installations for little fire ant. No Little fire ants were detected in the 106 acres surveyed.

Deliverable 8: OED will identify and assess 20 plant species from natural resource agencies and the general public.

The O'ahu Early Detection (OED) program connects scientific, herbarium-based research to invasive plant management by working with public agencies and private citizens to identify, document, and make recommendations about introduced and potentially invasive plant species. OED is a collaboration between the O'ahu Invasive Species Committee and Bishop Museum. Through surveys of residential, urban and natural areas on both public and private property, OED documents newly introduced plant species and assesses the threat of invasiveness of introduced plants to Hawai'i's environment and agriculture and the feasibility of eradication and control given the species' distribution. OED's work ensures that public dollars supporting invasive species control are used efficiently and effectively by helping agencies prioritize species and set realistic goals.

Additional Information

To make the most of limited resources, OISC focuses its activities where there is the greatest return for the effort invested, working to stop invasive species before they become established. OISC's partners and steering committee choose those species that have the potential to disrupt vital ecosystem services, threaten Hawai'i's food sustainability or severely degrade the quality of life on O'ahu. In 2013, OISC continued to stop the spread of an erosion-promoting tree, performed early detection for little fire ant and coqui frog, and controlled a rangeland weed that is toxic to livestock, humans and other plants.

For more information, please contact:

O'ahu Invasive Species Committee

743 Ulukahiki Street, Kailua, HI 96734 (808) 266-7994 oisc@hawaii.edu www.oahuisc.org

Title: Detection & Control of Invasive Species in Maui County
Organizations: Maui & Moloka'i Invasive Species Committees
Award: \$203,078



Introduction: Invasive species threaten Maui County's life-giving watersheds, agricultural sustainability, extraordinary biological diversity, and quality of life.

HISC funding supported detection and control work on 33 plant species, 3 vertebrate species, 1 invertebrate species, 1 aquatic species, and 2 plant pests. Work conducted by staff from the Maui Invasive Species Committee (MISC) and Moloka'i Invasive Species Committee (MoMISC) benefited from strong partner support. The Hawai'i Invasive Species Council provided approximately 11.5 percent of total FY13 funding (\$1.9 million) for the projects. HISC funds were matched 7:1 with support from county, federal, and private sources. This report covers activities from December 1, 2012 through July 31, 2013.

Achievements in FY13

Deliverable 1: Implement priority-setting process. Target species selection was based on threats to the environment and economy, feasibility of control, and cost of control. MISC held an annual priority-setting workshop that formed the basis for survey and detection work.

Deliverable 2: Meaningful participation by partner agencies and community. Each Committee is comprised of local resource managers, scientists, and agency representatives who help set priorities, provide guidance, and assist with securing financial support. During the reporting period the MISC Committee met three times and MoMISC held two meetings. Meeting topics focused on overall progress on plant and vertebrate targets, and outreach and education. MISC staff and committee members also met three times to review miconia and pampas grass operations. Contributed field time totaled 664 hours. Volunteers contributed 843 hours.



*Future conservation workers:
high school volunteer trip to Hāna*

Deliverable 3: Target 26 invasive species for detection and control activities. MISC and MoMISC conducted survey and detection activities on 38 species, including 33 plant species, 3 vertebrate species, 1 invertebrate (little fire ant), 1 invasive jellyfish, and 2 plant pests. The following numbers of invasive species were removed from the islands of Maui County: 27,992 plants; 1,000s of coqui frogs, 1,362 banana plants for BBTV. The total area surveyed was more than 22,959 acres; an estimated 303 acres were treated. MoMISC assisted with early detection surveys for *Myoporum* thrips.

Deliverable 4: Number of species detected and evaluated for feasibility of eradication. 1 - *Atriplex lentiformis* (quail bush) - Moloka'i.

Deliverable 5: Address specific widespread vertebrate pests. MISC staff played a leadership role in developing and implementing a comprehensive island-wide management plan for axis deer.

Deliverable 6: Reduce coqui frog populations on state lands. A large breeding population of coqui frogs is established in Māliko Gulch; the eastern half of the gulch is state land. Work focused on reducing the gulch population to prevent further expansion of coqui outside the gulch. Resources are not currently adequate to address the Māliko Gulch infestation. New reports of coqui frogs are increasingly common on Maui.

Deliverable 7: Contain or eradicate target species. With the exception of miconia on Maui, the number of mature targeted invasive plants is stable or declining on all islands. Outlier populations of miconia on Maui are in decline; the core infestation is being contained at the perimeter but growing more dense within the core. All new coqui frog reports on Maui, Molokaʻi and Lānaʻi had immediate and successful responses. No veiled chameleons have been detected since 2008. Mitred conure numbers are declining. Early detection surveys continued for little fire ant, including areas around the only known location on Maui with no detections.

Deliverable 8: Facilitate public process on agency jurisdiction and responsibility. MISC staff chaired the CGAPS Steering Committee during initial statewide efforts to develop a Plant Health Emergency Response Plan. Staff gave several presentations focused on this issue.

Deliverable 9: Present results at professional conferences. Staff and partners presented results at the Hawaiʻi Conservation Conference and Weed Science Society of America conference.

Other Activities in FY13

Other activity 1: Collaborate with other partner agencies on invasive species issues. MISC and MoMISC staff participated in local and statewide organizations focused on protecting important conservation and agricultural lands in Hawaiʻi. Staff served on the Legacy Land Commission, Molokaʻi Planning Commission, Aha Moku Council, Coordinating Group on Alien Pest Species Steering Committee, Maui Axis Deer Working Group, Maui Conservation Alliance and other community organizations. MoMISC hosted Congresswoman Tulsi Gabbard for an overflight tour of northshore Molokai. MoMISC and MISC hosted Senator Mike Gabbard for a tour of invasive species work on each island. MISC provided office space for the Weed Risk Assessment technician and Maui Axis Deer Coordinator.

Other activity 2: Recognitions/Awards. MISC was recognized as one of three local "heroes" by Maui's public access TV station Akakū.

Additional Information

The proposal for funding covered a full twelve months, while the reporting period covers only eight months. Despite that discrepancy, achievements met or exceeded most of the proposed deliverables. MISC and MoMISC are projects of the University of Hawaiʻi – Pacific Cooperative Studies Unit.

Contact Information

Teya Penniman
MISC Manager
P.O. Box 983
Makawao, HI 96768
Ph: 808-573-6472 (MISC)
Email: misc@hawaii.edu

Lori Buchanan
MoMISC Field & Outreach Coordinator
P.O. Box 220
Kualapuʻu, HI 96767
Ph: 808-954-6585
Email: lbuchanan@tnc.org

Title: Detection and Control of Invasive Species on the Island of Hawaii
Organization: Big Island Invasive Species Committee
Award(s): \$233,078



Introduction: The Big Island Invasive Species Committee works to identify, detect, eradicate and control the highest risk invasive species likely to impact the environment, economy, or human health on the Island of Hawai'i. Our motto is *Hoala i ka Maka*: Healing the land; Awakening the people. BIISC strives to educate and empower the members of our community to take an active role in preventing and controlling the spread of invasive species that directly or indirectly impact Big Island livelihoods. The Hawaii Invasive Species Council provides consistent and much needed support, ensuring that the highly trained, experienced professionals working at BIISC may continue on our mission. BIISC thanks the Hawaii Invasive Species Council for funding approximately 33% of our operating budget this year.

Achievements in FY13

Deliverable 1: Comprehensive annual report outlining all work conducted and accomplishments under this project: Provided here.

Deliverable 2: Spatial and tabular data submitted for inclusion in the statewide data set on invasive species work: Electronic files documenting all control work are submitted to PBIN on an annual basis.

Deliverable 3: Acres surveyed; Acres Treated: BIISC surveyed 4,699 acres this fiscal year, 1,666 of those acres on foot. BIISC directly treated plants on treated 109.4 acres.



New BIISC Manager Springer Kaye with new Big Island partner, the Office of Mauna Kea Management, and weed pull volunteers.

Deliverable 4: Plants or animals controlled: BIISC controlled 11,815 target plants. If Feral Coffee removal is included, BIISC staff controlled over **55,000** individual plants by hand this year. BIISC cleared 11.3 acres of habitat for Coffee Berry Borer, found at densities of several hundred insects per square meter. BIISC staff spent 176 hours responding to Brown Tree Snake reports, sprayed for Coqui 51 times (numbers not recorded), trapped 48 mongooses in endangered waterbird habitat, and conducted surveys establishing the existence of a breeding rabbit colony in Kona.

Deliverable 5: Person hours expended: BIISC staff and volunteers spent more than 7,020 hours in the field surveying for and controlling invasive species.

Deliverable 6: Miles of Roadside Surveyed: BIISC Staff surveyed 125 miles of road during 180 staff hours of survey time. ***Linaria purpurea*, a serious invasive pest in the Southeastern United States, was identified and eradicated this year.** New Plant Records identified included: *Norantea guianensis*, *Parkia speciosa*, *Mimusops elengi*, *Vinca major*, and *Leea indica*.

Deliverable 7: Nurseries or botanical gardens surveyed: BIISC Staff surveyed three "big box" nurseries (Lowe's, Home Depot, K-Mart) to vet methods for FY14 nursery survey project.

Other Activities in FY13

Progress on Eradication Targets: BIISC has six island-wide eradication target species. During this reporting period, BIISC completed initial control of 100% of survey areas for four of these six species. Pampas Grass has just two remaining known plants, each protected by their landowners. Forty-three percent of the 2700-acre projected survey area for Wax Myrtle has been surveyed and controlled.

New Management: BIISC welcomed new Manager Springer Kaye, formerly the Invasive Plants Project Leader for Pohakuloa Training Area. Ms. Kaye implemented a restructuring plan to double the ratio of field to office staff at BIISC, and laid the groundwork for a professional Public Relations contract for BIISC. Embracing the BIISC motto: *Hoala i ka maka*, Ms. Kaye seeks to engage and empower communities to take the lead in invasive species control in their neighborhood communities.

Policy initiatives: BIISC Executive Committee members gave a presentation on albizia to the Big Island Caucus of the state legislature, with 100% attendance. Follow-up included the first Albizia Stakeholder's Meeting in Hilo with over 40 in attendance, and HISC support for an albizia demonstration project in the Puna district, leading to two submitted bills, and unprecedented state, county, and private cooperation.

Next Generation: With the assistance of HISC and private funds, BIISC supported two PIPES interns, a summer HYCC intern, and hosted two HYCC teams this summer. Youth ventured into pristine lowland rainforest (found nowhere else in the state) to eradicate miconia, upland mesic forest in search of Cotoneaster, and conducted ant and wekiu bug surveys at the summit of Mauna Kea.

Additional Information

Protecting the Biggest Island: The Big Island is larger than all of the other islands combined. It is home to more than 70% of the state's Strategic Forest Reserves, and more than half the State Important Agricultural Lands. To achieve operating efficiency, BIISC needs to base 5-person field teams in Hilo, Ka'u/South Kona, and Kohala. Expansion to this capacity could be accomplished with the vehicles on hand, and an additional \$202,000 for salary and supplies for each new team for a total of \$404,000 per year. If facilities could be obtained from the College of Tropical Agriculture and Human Resources in Waimea and Captain Cook, the expansion could be accomplished for approximately \$380,000. The ratio of staff to acreage of land will still be significantly less than that found in any other county.

The next Miconia: The most cost effective way to eliminate an invasive species is to catch it before it becomes widespread, which is why the invasive species focus on early detection targets. When our most injurious invasive species are already widespread, however, the community wants to know why we do not focus our energies on the problems they can see. Though time-consuming, BIISC has a renewed focus on training community groups in invasive species identification, management, and advocacy.



Jason Flemming, who joined BIISC in 2005, ventures onto a`a flows to assist DOFAW with gorse control.

For more information, please contact:
Springer Kaye,
BIISC Manager (808) 933-3340

VII. HISC Public Outreach Working Group

Public Outreach Working Group (POWG) Goals

- Educate the public and private sector about invasive species to positively affect perception, action, and funding for control and prevention.
- Foster awareness and concern in the general public about invasive species.
- Increase public and private support.
- Seek measurable changes in behavior.
- Promote priority messages in HISC Strategy.



Students help to remove invasive algae during the 'Aina Ho'ola o Ma'ililikahi Youth Conference on Conservation and Agriculture co-organized by HISC.

Funded Projects for FY13

The lead agency and chair for the Public Outreach Working Group transitioned from DOH to DLNR in FY13.

During the FY13 budget process, the Public Outreach Working Group funded eight projects, totaling \$201,000:

- Public Outreach and Education in Kaua'i County: \$30,000
- O'ahu Island Invasive Species Public Education and Outreach: \$30,000
- The Hawai'i Ecosystem at Risk Project and Updates to Hawai'i Invasive Species Partnership Websites: \$15,000
- Public Outreach and Education in Maui County: \$30,000
- Invasive Species Education and Outreach on Hawai'i Island: \$30,000
- Supporting Invasive Species Outreach Efforts: Consolidated Online Public Pest Reporting, Improved Interagency Communication & Enhanced Web Content: \$40,000
- Cultivating Invasive Species Awareness among Farmers: \$5,000
- E Huli! Hawaiian Islands Ungulate Report: \$1,000 (this award was not issued at the request of the awardee due to unforeseen project considerations)
- Aquatic Invasive Species Outreach: \$20,000 (this award was not encumbered due to unforeseen project considerations)

Key Activities in FY13

- Funded projects provided a combined **7,932 hours of outreach effort**
- Estimated reach of **323,187 individuals** across all projects
- Hawaii Bioblitz app connected public and scientists during Hawaii Invasive Species Awareness Week
- Targeted outreach to farmers on Oahu about invasive species threats
- High quality newsletters produced
- Outreach at county fairs

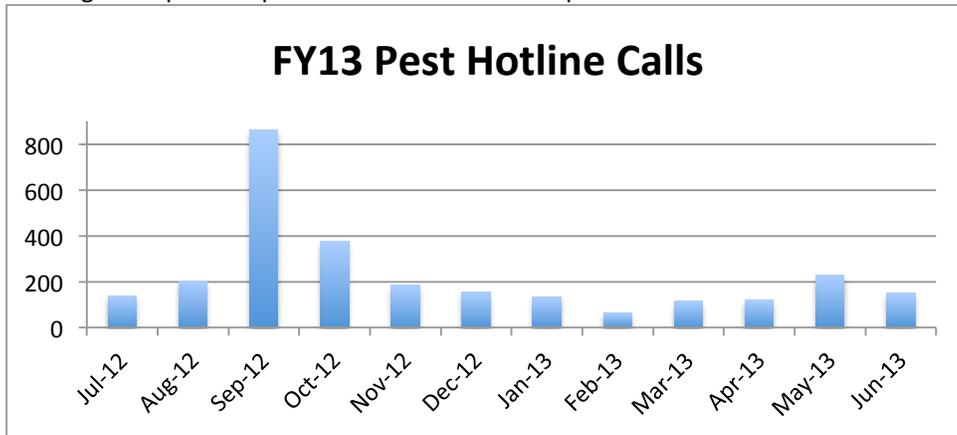
Measures of Effectiveness for the Public Outreach Working Group

Pest Hotline

The original set-up charges for the Pest Hotline (643-PEST, a statewide direct-dial number that is routed to the local office of the Department of Agriculture) were funded by the HISC,



and the HISC POWG continues to promote this number as a reporting tool for the public. In FY13, the Pest Hotline received 2,725 calls, compared to 1,353 calls in FY12. It is imperative that HDOA has adequate staffing to respond to pest hotline calls from the public.



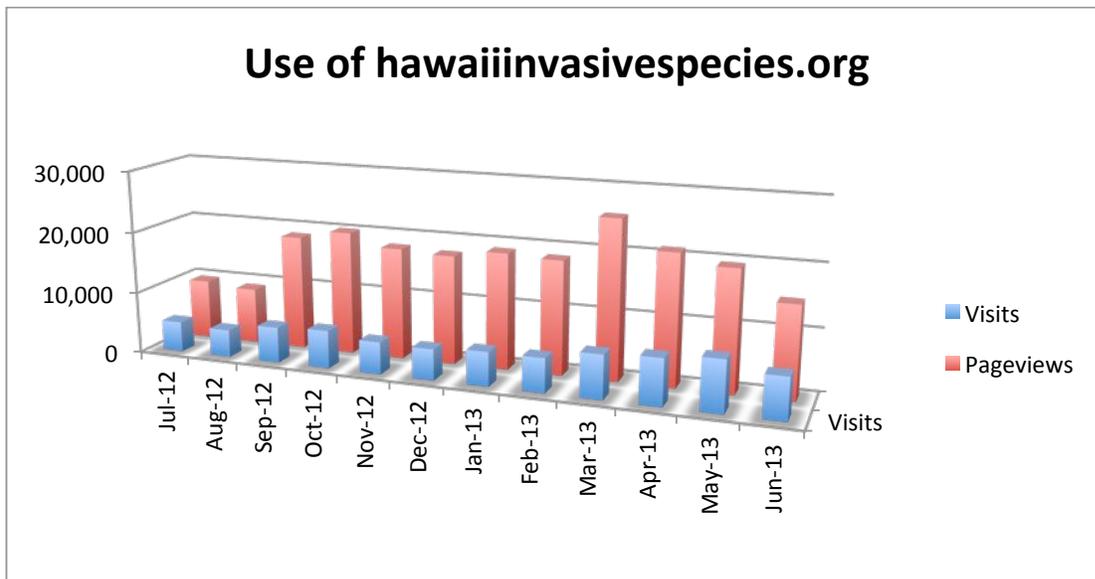
HISC Websites

In FY13 the HISC website transitioned to the “Hawaii.gov” domain, to better reflect the HISC as a cabinet-level government agency. The HISC’s new website is at <http://hisc.hawaii.gov>. Though files for the website are stored under the DLNR site as the administrative host of the Council (dnr.hawaii.gov/hisc/), the HISC website URL is meant to reflect HISC as an interagency cabinet effort rather than a DLNR program.

The HISC’s former website, www.hawaiiinvasivespecies.org/hisc/, remained online during the transition, but is slated to redirect users to the new site. The hawaiiinvasivespecies.org domain continues to hosts the pages for the Coordinating Group on Alien Pest Species (CGAPS), the Invasive Species Committees (ISCs), and general invasive species information.

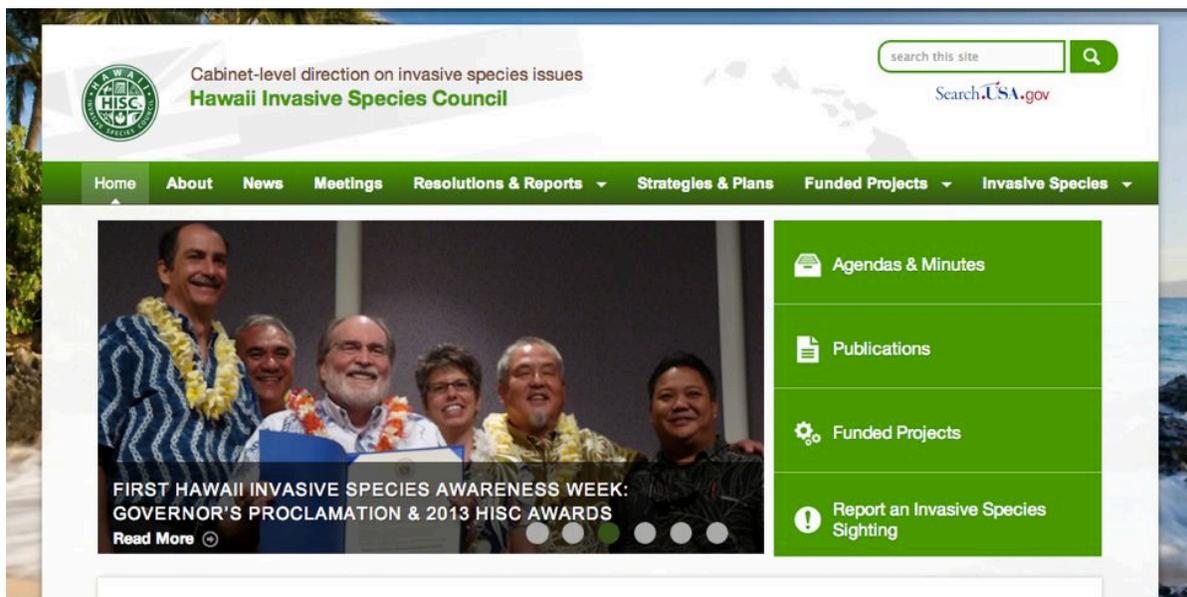


For www.hawaiiinvasivespecies.org in FY13, the logged number of website “hits” totaled 1,029,571 up from 622,955 in FY12. The total number of pageviews for FY13 was 211,256, which comprised 72,131 visits by 49,058 unique visitors.



The HISC also maintained a website specific to the first Hawai'i Invasive Species Awareness Week, at <http://hisaw2013.blogspot.com>. This site promoted information and events surrounding the first HISAW in March, 2013, and promoted the winners of HISC Awards. This site received 6,626 pageviews in FY13.

The new HISC website, <http://hisc.hawaii.gov>, was opened to the public in late April of 2013. Where the hawaiiinvasivespecies.org domain serviced three organizational groups (HISC, CGAPS, and the ISCs), the new site hosts information solely for the HISC. Web traffic from late April through the end of June 2013 totalled 4,197 visits.



The new HISC website at <http://hisc.hawaii.gov>

Title: Cultivating Invasive Species Awareness among Farmers

Organization: Oahu Resource Conservation and Development Council, in partnership with the Mayor's Office of Economic Development

Award(s): \$5,000



Introduction: Oahu RC&D is a non-profit organization dedicated to conserving our natural resources by building capacity among those working literally at the grass-roots level in Hawaii's sustainability movement. We provide information, training and consultation to farmers and individuals making on-the-ground decisions regarding the use of soil and water resources and the production of local food. Through a partnership with the Office of Economic Development and the City and County's Agricultural Liaison, Oahu RC&D developed three workshops to increase invasive species awareness and action among the agricultural community. Organizational costs to host the three workshops equaled \$7,500, plus an additional \$2,500 of in-kind support from host farmers and partner organizations. HISC funds covered 50% of the total project budget (\$5,000).

Achievements in FY13

Pasture Management Workshop: Kualoa Ranch hosted a farm tour featuring their efforts to improve pasture management (healthy pastures are less susceptible to invasive plants) and raise local beef. Participants also heard about management efforts through the Ko'olau Mountains Watershed Partnership. Attendees = 12.

Native Plants Workshop: Hui Ku Maoli Ola hosted a workshop and nursery tour featuring numerous native plant species, including history, cultural use and a discussion on why selecting native plants is good for Hawaii's environment and economy. The workshop also included a live demonstration of the Plant Pono website. Attendees = 35.

Beekeeping Workshop: Nalo-Meli and UH-CTAHR hosted a workshop on beekeeping and honey production that allowed participants to satisfy their sweet tooth and gear up to support our wild and domestic honey populations. In-depth information on two common bee pests (varroa mite and small hive beetle) was shared by UH researchers and Department of Ag specialists. Attendees = 40.



Rick Barboza (in yellow) discussed native plant production at Hui Ku Maoli Ola, and how to select native plants for use in landscaping.

A representative from the Oahu Invasive Species Committee was present at each workshop to discuss their efforts and provide information on identification and control of invasive species. The City's Agricultural Liaison was also present at the workshops to talk with and hear from participants.

In addition to the workshops, invasive species information was distributed to more than 2400 people via Oahu RC&D's electronic news bulletin in October 2012.

There is growing interest among the agricultural community in this topic, and Oahu RC&D routinely seeks funds to conduct outreach targeting farmers and landowners. We expect the need for this activity to increase given the continued introduction of plant and agricultural products (and pests) in Hawaii.

For more information about Oahu RC&D and its programs, including upcoming workshops, please visit www.oahurcd.org, call 808-622-9026 or send us a note at admin@oahurcd.org.

Title: Public Outreach & Education in Kaua'i County
Organization: Kaua'i Invasive Species Committee
Award: \$30,000



Introduction: The continued introduction and spread of unwanted pest and invasive organisms harms our economy, water supply, native bio-diversity, health, and the lifestyle and culture unique to this island. The Kaua'i Invasive Species Committee (KISC) is a voluntary partnership of government, private, non-profit organizations, and individuals working together to: prevent the introduction of potentially damaging pest species to the island, eliminate recently arrived (incipient) pests before they spread beyond control, manage established pests in order to reduce their negative impacts, and **educate and involve the public** as to the magnitude of the invasive species problem and the need for control programs such as KISC. KISC works in partnership with existing programs and aims to assist in the coordination of efforts island-wide. KISC's priorities are those species that are recognized as having the greatest potential to harm human welfare and native biodiversity, and where the use of limited resources is most likely to be successful.

KISC estimates that its FY13 total funding need exceeded \$900,000, including public outreach activities. Although KISC's annual funding fell far short of this need, HISC provided approximately 37% of KISC's acquired FY13 funding.

Achievements in FY13

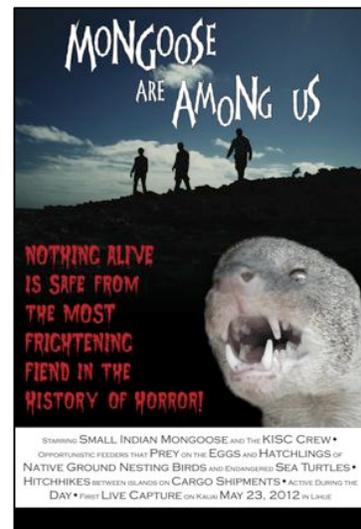
Published professional quality e-newsletters: KISC's annual e-newsletter focused on "A year of learning" and incorporated many articles submitted by partners regarding collaborative projects. KISC also e-published the Mongoose Monitor newsletters that outlined monthly activities regarding mongoose detection.

- <http://www.hawaiiinvasivespecies.org/iscs/kisc/pdfs/KiaIMokuVolume6Issue1.pdf>
- <http://www.hawaiiinvasivespecies.org/iscs/kisc/pests/mongoose/mongoosemonitor.htm>

Pest alerts and flyers: Informational and educational materials are an important tool when communicating with not only with the general public, but also with partners and conservation collaborators. Flyers this year focused on early detection species as well as mongoose reporting information. *Published ~1,000 pieces.*

Informative website and social media: KISC helps to maintain the website www.kauaiisc.org as well as KISC's Facebook page (<https://www.facebook.com/pages/Kauai-Invasive-Species-Committee/103663463003431>), making sure that all materials are relevant and up-to-date. *KISC's total Facebook posts reached 6,827 people.*

Informational banners and posters: KISC's "Admit None" outreach campaign featured B-Horror Movie posters featuring priority target species (pictured above). These posters can also be found online at: <https://www.facebook.com/media/set/?set=a.421713451198429.88276.103663463003431&type=3>.



Movie poster designed for "Admit None" campaign

Port signage regarding inter-island movement: By partnering with the Hawaii Department of Agriculture (HDOA), Young Brothers, Inc., and Hawaii Department of Transportation – Airports Division, KISC was able to install informational and educational signage at Kauai's Harbor and at the Lihue Airport (in the main lobby and in each baggage claim area). Harbor signage focuses on early detection and reporting, targeting inter-island movement of goods. Signage at the airport focuses on general educational information about native and invasive species in Hawaii as well as what Kauai's priority invasive species are and how to report sightings. (*Potential annual target audience ~100,000+*)

Interactive display: To engage the public and to gauge whether invasive species information is understood, KISC designs an interactive display for the public. This year, fair-goers were able to sign their name to "Admit None" tickets on a large movie-marquee. (*Target audience ~300 signatures*)



Mayor Bernard Carvalho signs KISC
"Admit None" movie marquee

Final Legislative Report: KISC's legislative report information can be found online at: <http://dlnr.hawaii.gov/hisc/files/2013/02/Invasive-Species-Rpt-FY12-Sec-194-2.pdf>

Other Activities in FY13

Participated in fairs and events: Throughout the year, KISC participates in fairs and events: (3,801 people reached)

- Arbor Day, Garden Fair, Earth Day at KCC, Agriculture Awareness and Education event, Banana Poka Roundup, County Fair, Ocean Awareness Day

Published quarterly newsletters: <http://www.hawaiiinvasivespecies.org/iscs/kisc/>

Conducted Early Detection Workshops as part of "Eyes & Ears ED Network": 75 people reached

- Kīlauea National Wildlife Refuge
- Kaua'i Forest Bird Recovery Project
- Kapa'a High School JROTC
- Young Brothers port workers

Presentations and school group interactions: 80 people reached

- Kīlauea Elementary School
- Master Gardeners
- Rotary Club of Princeville
- Hanapepe Library presentation

For more information, please contact: Keren Gundersen, KISC Project Manager, kgunder@hawaii.edu 808-821-1490, www.kauaiisc.org

Title: Outreach Program
Organization: O'ahu Invasive Species Committee
Award(s): \$30,000



Introduction: The O'ahu Invasive Species Committee was founded by a group of volunteers concerned about the spread of miconia and fountain grass on O'ahu. These pests had already wreaked havoc on the ecosystems of other islands, but were only just beginning to do damage on O'ahu. OISC realized early on that outreach is essential to all field operations. Since OISC's mission depends on getting voluntary permission from private property owners for OISC field crews to survey their lands, outreach is key. Also, the public can report OISC target species and assist OISC's mission by making responsible choices when choosing plants for their home landscaping. HISC funds supported 54% of the budget for the outreach program.

Achievements in FY13

Built support for invasive species work in the communities where OISC field crews operate through work with landowners and community groups:

Working with landowners is a continuing outreach activity that involves securing permission for field crews to access, survey for and remove miconia or other target invasive species from a private property or area, requiring one-on-one communication with landowners and community groups. In FY 2013, the outreach specialist engaged 56 landowners in invasive species control that involved 209 contacts with these landowners by phone, email and/or letter. Ninety-eight percent of all landowners contacted agreed to allow access to their property for invasive species control. One landowner refused to allow an early detection target species, *Pennisetum villosum*, an invasive grass, to be removed from her garden plot, but she did agree to remove the flowering heads to curb seed production and the spread of the plant. A follow up survey in early 2013 found that the plant was no longer in the garden plot and had been removed. The site will be monitored by the OISC field crew for potential re-growth of the *P. villosum* plant.



After the outreach specialist secured permission from the landowners, the OISC field crew searched the cliffs of a private property in Wai'anae to locate and remove an incipient population of invasive fountain grass

The Mānoa Neighborhood Board regularly invites OISC to present information about invasive species at their monthly meetings, providing an opportunity for OISC to speak about OISC's activities as well as new initiatives by HISC and other partner programs. In FY 2013, presentations were given on how to make responsible planting choices using the Hawai'i Pacific Weed Risk Assessment, how to detect and report coqui frogs on O'ahu (co-presented with the Hawai'i Department of Agriculture), how to participate in the statewide Hawai'i Bioblitz event to learn about native, non-native and invasive species in their area, and OISC's 2012 accomplishments for miconia control work in Mānoa Valley. OISC also presented at Wai'anae Neighborhood Board meetings regarding a joint helicopter spray operation between OISC and the O'ahu Army Natural Resources Program to control an incipient population of invasive fountain grass in Wai'anae. The board continues to support these operations and understands that fountain grass is a high priority species to control because infestations can cause more frequent and destructive brush fires. OISC communicated with the Board to inform them of scheduled spray operations and presented at two neighborhood board meetings to provide updates on the operations as well as to answer questions from the community.

Operated the OISC volunteer program in partnership with Lyon Arboretum:

OISC's volunteer program is a partnership with Lyon Arboretum that leads volunteers to remove three harmful invasive plant species from Lyon's plant collections, (*Ardisia virens*, *Ardisia sieboldii* and *Stromanthe tonckat*). The volunteer program raises awareness about and garners support for invasive species issues by involving the public in hands-on efforts to remove incipient invasive species and gives them an opportunity to experience the success of their work as plant numbers decline over time. In FY 2013, OISC's volunteer program engaged 58 volunteers who contributed 340 volunteer hours to remove 7,001 individual plants of the three targeted invasive plant species. Efforts will continue until these species can be declared eradicated.



OISC volunteers found and removed this Ardisia virens plant, an invasive species found only at Lyon Arboretum that could damage O'ahu's watershed forests

Assisted with the development and implementation of a statewide public outreach event for Hawai'i Invasive Species Awareness Week in 2013:

OISC's outreach specialist collaborated with other members of the HISC Public Outreach Working Group to develop, market and implement a week-long, state-wide event coinciding with the inaugural Hawai'i Invasive Species Awareness Week. The focus of the event was a "Hawai'i Bioblitz" that invited residents of all ages to discover, photo-document and post on the Project Noah website the plants and animals they encounter in their everyday lives. The event also offered the opportunity for the public to interact with local plant and animal experts to learn about which species in Hawai'i are native and non-native, and which non-native species are harmful as invasive. 158 people took part in the event posting 340 photos of plants and animals for identification by the 30 local experts who signed on to participate.

A "Go Out and Listen Night" event was developed, marketed and implemented to promote the use of a new coqui frog reporting program on O'ahu, the Honolulu 311 mobile app:

OISC partnered with the City and County of Honolulu Department of Information Technology to add the reporting of coqui frog to the City and County's "Honolulu 311" mobile application to test using this technology for reporting by the public. OISC's outreach specialist developed and marketed a "Go Out and Listen Night" event that involved members of the public going outside, listening for the sound of the invasive coqui frog, and reporting if they did or did not hear the frog. Marketing included an informational website, press releases and media interviews. The event engaged the participation of 133 residents from across O'ahu reporting to OISC through email, phone or the mobile app, with the majority (69%) reporting using the mobile app. Twelve reports of coqui frogs were investigated by the O'ahu Invasive Species Committee in cooperation with the Hawai'i Department of Agriculture and were identified as greenhouse frogs, another introduced invasive frog that, unlike coqui frog, is already established and widespread on O'ahu. OISC's outreach specialist was interviewed by two television news and one radio reporter, and the event was featured in 14 newspaper and television stories. The event website received approximately 4,300 visits, indicating the message about how to identify and report coqui frogs on O'ahu reached beyond those that participated the event that night.

Presented information about invasive species to public and private organizations and at community and public events:

OISC delivered a total of 34 presentations and event participations that reached approximately 5,600 people from a wide variety of audiences across O'ahu. Audiences included members of the general public, legislators, landscape and agriculture industry professionals, teachers and students (elementary to college level), neighborhood board and community members, geographical information services (GIS) user groups, map librarians, and heavy machinery operators working on the Honolulu rail project. Events included the Hawai'i Youth Conservation Corps Environmental Fair, the UH CTAHR O'ahu Agriculture and Environmental Awareness Day, Agriculture Awareness Day at the State Capitol, the Science Alive event at Bishop Museum, and career days at various schools in Wai'anae.



Parents and children play an interactive game about invasive species at the OISC outreach booth

Conducted outreach through traditional and social media:

The OISC outreach specialist wrote two articles that were published in traditional print: "Big, bad weeds" featured in GREEN magazine in July 2013 reaching 25,000 readers and "Beware the call of the coqui" featured in the Sierra Club's Malama i ka Honua Newsletter in April 2013 reaching 4,000 readers. The outreach specialist participated in one radio and 5 television interviews related to the "Go out and Listen Night" event and other invasive species topics reaching an audience of 679,000 residents. OISC maintains a Facebook page to use social media to educate members of the public about OISC's activities and invasive species issues. In FY 2013, OISC's outreach specialist made 329 posts on OISC's Facebook page, the number of "likes" on the page increased by 184 to reach 474, and the page had an average weekly reach of 628 people (an increase from year 2012's average weekly reach of 477 people).

For more information, please contact:

Julia Parish, Operations Manager
O'ahu Invasive Species Committee
743 Ulukahiki St., Kailua HI 96734
Phone: (808) 266-7994, Email: oisc@hawaii.edu

Title: Public Outreach and Education for Maui County
Organization: Maui Invasive Species Committee
Award: \$30,000



Introduction: Outreach and education are integrated components of the MISC and MoMISC projects. Comprehensive outreach programs have a strong basis in field experience. This report covers HISC funding expended over the period from December 2012 through August 31, 2013. HISC funds covered approximately 32% of outreach efforts in Maui County.

Achievements in FY13

Deliverable 1: Publish 12 monthly articles on invasive species topics and create press releases generating media mentions. The proposed deliverable was based on a full 12 months. MISC published 9 monthly articles; an additional 9 articles mentioned MISC. Articles appeared locally in the Maui News and Maui Weekly as well as statewide in Honolulu Magazine.



Parade float for the Makawao Fourth of July Parade, highlighting work on pampas grass in local watersheds.

Deliverable 2: Use broadcast media to inform the public about invasive species in general and specifically about the little fire ant. Public service announcements about the little fire ant aired 248 times on Maui County cable stations and reached an estimated 52,600 viewers. PSAs also aired on the Maui County's public access station Akakū. MISC staff provided on-air interviews for the *Sparks Your Interest* program on local radio station PYCC, and on Hawai'i Public Radio's *The Conversation*.

Deliverable 3: Create and staff informative displays at 10 community events reaching more than 2,000 people. MISC and MoMISC participated in or coordinated 8 community events reaching approximately 6,300 people. Events included the week-long "Spot the Ant & Stop the Ant" radio contest, Moloka'i Earth Day, and Akakū's Walk of Heroes.



Field crew leader Dennis Green explains symptoms of banana bunchy top virus to attendees at the Maui County Agricultural Festival.

Deliverable 4: Present annual award to a landscape professional or educator for proactive role on addressing invasive species. The annual Mālama i ka 'Āina award will be presented at the usual time - Fall 2013, which did not occur during the reporting period. Outreach staff continued to work closely with local landscape industry members by attending association meetings and giving presentations.

Deliverable 5: Reach 50-100 people during presentations to community groups. Give presentations at one or more professional meetings. MISC's outreach program reached approximately 289 people via presentations and workshops. Two professional presentations occurred at the Hawai'i Conservation Conference.

Deliverable 6: Bring the invasive species message to more than 500 students during classroom visits. MISC reached approximately 1,410 students in Maui County. Outreach staff covered 64 different classes over 36 days of visits. Many of the visits helped with testing activities for the Hō'ike o Haleakalā Invasive Species module, developed by MISC and designed for statewide use.

Deliverable 7: Lead 2 volunteer trips. MISC led 14 local students on a week-long trip to remove miconia from East Maui and students from Kīhei Charter School assisted with coqui control.

Deliverable 8: Conduct curriculum workshop on Hō'ike o Haleakalā, Maui's science-based curriculum. Staff conducted a three-day teacher workshop in August 2013 for 7 local teachers. This workshop was conducted in partnership with the Department of Education; successful completion requires implementation of 6 classroom lessons and provides teachers with credit towards pay increases.

Deliverable 9: Host interns from a recognized internship program. MISC hosted 3 AmeriCorps summer interns in addition to 1 year-round intern and worked closely with the Haleakalā National Park's internship program.

Other Activities in FY13

Other activity 1: Online presence. MISC and MoMISC maintain 7 Internet and social media sites: mauiisc.org, momisc.org, mauiinvasive.org, coquifreemaui.org, lfa-hawaii.org, hoikecurriculum.org, and the MISC Facebook page. Pageviews on these sites within a portion of the reporting period (Jan-June 2013) totaled 11,731.

Other activity 2: Early Detection outreach. MISC staff worked closely with outreach professionals from the East Maui Watershed Partnership and Maui Forest Bird Recovery Project to develop a training program on natural resources and conservation for local tour guides and tour operators. Trainings are scheduled to begin in Fall 2013. MoMISC staff developed a targeted outreach campaign to raise awareness about fireweed, an incipient weed on Moloka'i, and reached approximately 100 people in the ranching community.

Other activity 3: Response center. MISC and MoMISC are recognized in their respective communities as resources for invasive species issues and field numerous phone calls about species not directly related to funded work on target pests. An estimated 30 phone calls were fielded by MISC and MoMISC.

Additional Information

The proposal for funding covered a full twelve months, while the reporting period covers only nine months. Despite that discrepancy, achievements exceeded most of the proposed deliverables. MISC and MoMISC are projects of the University of Hawai'i – Pacific Cooperative Studies Unit.

For more information, please contact:

Lissa Fox Strohecker
MISC PR Outreach Specialist
P.O. Box 983
Makawao, HI 96768
Ph: 808-573-6472 (MISC)
Email: miscpr@hawaii.edu

Lori Buchanan
MoMISC Field & Outreach Coordinator
P.O. Box 220
Kualapu'u, HI 96767
Ph: 808-954-6585
Email: lbuchanan@tnc.org

Title: Invasive Species Education and Outreach on Hawai'i Island

Organization: Big Island Invasive Species Committee

Award(s): \$30,000



Introduction: The Big Island Invasive Species Committee works to identify, detect, eradicate and control the highest risk invasive species likely to impact the environment, economy, or human health on the Island of Hawai'i. Our motto is *Hoala i ka Maka*: Healing the land; Awakening the people. BIISC outreach strives to educate and empower the members of our community and Hawaii Island's vibrant green industry to take an active role in preventing and controlling the spread of invasive species. BIISC thanks the Hawaii Invasive Species Council for funding 100% of our outreach budget this year.

Achievements in FY13

Deliverable 1: Provide consistent representation for invasive species issues at community events: BIISC reached an estimated 6,210 residents at 28 community fairs and other events. Key messages included containing pets, and "Don't pack a pest."

Deliverable 2: Provide targeted outreach to Hawaii's green industry professionals: BIISC reached an estimated 1,535 members of the agricultural and horticultural industry through attendance at 21 green industry events.

Deliverable 3: Educate students about invasive species issues: BIISC staff provided classroom lessons, activities, fieldtrips and workshops to approximately 650 students, from preschool to retirement age.

Deliverable 4: Provide directed messaging on target species to appropriate audiences: BIISC staff visited community association meetings to present information and obtain rights of entry to eradicate three target species, directly communicating with at least 60 residents in areas of control activities. BIISC staff actively promotes Little Fire Ant materials in cooperation with the Hawaii Ant Lab at all events. BIISC developed and printed 400 sets of high-quality invasive species I.D. cards, for general distribution.



New BIISC Manager Springer Kaye with new Big Island partner, the Office of Mauna Kea Management, and weed pull volunteers.

Other Activities in FY13

Progress on Eradication Targets: BIISC has six island-wide eradication target species. During this reporting period, BIISC revamped target species informational brochures to include permissions and treatment information, and a new more polished look.

New Management: A review of funding levels and efficacy of outreach work led to the difficult decision to move from an outreach position at BIISC to a professional Public Relations contract. BIISC does not intend to give up its presence in the community, but will strive to make it more effective, and more relevant. Embracing the BIISC motto: *Hoala i ka maka*, all BIISC staff have begun to engage and empower communities to take the lead in invasive species control in their neighborhood communities.

Policy initiatives: BIISC Executive Committee members gave a presentation on albizia to the Big Island Caucus of the state legislature, with 100% attendance. Follow-up included the first Albizia Stakeholder's

Meeting in Hilo with over 40 in attendance, and HISC support for an albizia demonstration project in the Puna district, leading to two submitted bills, and unprecedented state, county, and private cooperation.

Next Generation: With the assistance of HISC and private funds, BIISC supported two PIPES interns, a summer HYCC intern, and hosted two HYCC teams this summer. Each participant was trained in key statewide messages for invasive species prevention and control. A session on policy and funding was held for the long term interns, to help them appreciate the need for continued advocacy as they continue their career paths.

Additional Information

Protecting the Biggest Island: Public outreach is a key component of success in invasive species management. We can't do it alone, and you don't develop great advocates and volunteers without constant contact. The direct reliance of residents on natural resources, which may include invasive species, presents both obstacles and opportunities to engage Big Island residents in BIISC activities. BIISC looks forward to a new chapter working with a professional public relations firm to develop a communications strategy and direct marketing campaign for FY14. Additionally, we hope a new strategy of channeling our outreach efforts toward directly training and assisting community groups in invasive species control and advocacy for their community will reap long term benefits in public recognition and support for invasive species control efforts at the state level.



BIISC staff and long-time partner Malama O Puna attracted dozens of volunteers to remove mangroves from anchialine ponds.

For more information, please contact:

Springer Kaye,
BIISC Manager (808) 933-3340

Title: Supporting Invasive Species Outreach Efforts
Organization: Hawaii Biodiversity Information Network
Award(s): \$40,000



Introduction: The Hawaii Biodiversity Information Network (HBIN) provides for the continued maintenance, update, and expansion of a core invasive species outreach information infrastructure in Hawaii. Associated web products, databases, and data management services are important to the outreach efforts of certain programs in the State.

At an ideal full capacity, the HBIN yearly budget need would be \$220,000. At its current capacity the yearly budget is approximately \$100,000. In FY13 HBIN requested \$50,875 to fund the creation of specific technical products to aid in invasive species outreach efforts and interagency communication. HBIN received \$40,000 (79% of FY 13 request; 40% of its current capacity budgetary needs; 18% of its ideal full capacity budgetary needs).

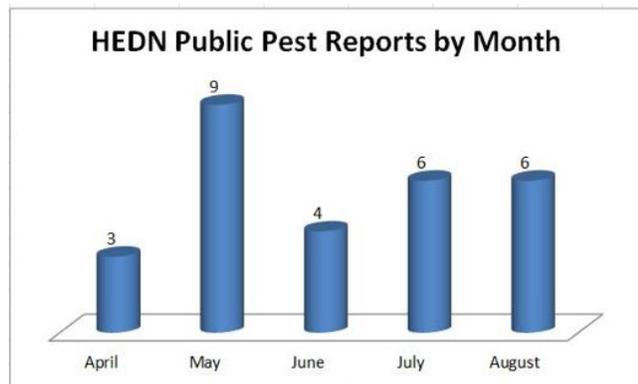
HBIN began HISC FY13 project implementation and the use project funds in April 2013 and will continue until the end of the calendar year. This report details HBIN achievements from April 2013 to the present time.

Achievements in FY13

Hawaii Early Detection Network – Pest

Reporting System: Curate all HEDN public reports... (Review of initial report, interaction with reporter, facilitation of Assessment process, species identification, and referral to rapid response agency).

The Hawaii Early Detection Network (HEDN) Report-A-Pest (RAP) online pest reporting system (reportapest.org) is hosted and managed within the HBIN infrastructure. Since April 2013, 28 pest reports have been received from the public through the online pest reporting form. Reports may be in various stages of the curation process. Approximately 15 different species are the subject of these 28 reports.



Hawaii Early Detection Network – Pest Reporting System: Update and expand pest reporting internal referral and responder tree for all agencies and islands.

A complete review of the internal referral and responder tree is underway. We expect to have this completed by the end of November.

Hawaii Pest Reporting Feed / Widget (Pest Report Access Tool – PRAT): Create a customized “Feed” that aggregates HEDN Public Pest Reports, 643-Pest Hotline Reports (public), and Interagency Notifications.

The technological framework for the creation of RSS feeds for HEDN Public Pest Reports, 643-Pest Hotline Reports and Interagency Notifications has been established. Instead of having one aggregated feed as was originally planned, three different feeds (one for each type of report) will be generated. This will allow the end-user of the PRAT tool to choose which information feeds to access through the tool.



Reportapest.org and the Hawaii Early Detection Network site managed by HBIN

Hawaii Pest Reporting Feed / Widget (Pest Report Access Tool – PRAT): Develop customized Pest Report Widget that will consume the Pest Report “Feed” and can be placed on a user’s desktop.

The beta version of the Pest Report Access Tool (PRAT) has been developed and is in the testing phase. The tool allows users to view incoming Pest Reports or Interagency Notifications in near real-time. PRAT tool features:

- Easy to install run-time executable
- Small graphical user interface that is designed to stay open on a user’s desktop
- Ability to customize information feed consumption
- Hard-coded update frequency
- Ability to “Check Now”

643-Pest Hotline Support and Integration: Create customized online form and web application / database logic to capture, store and refer 643-Pest Hotline reports.

A beta version of a 643-Pest Hotline report form has been developed. The requirements for this input form were based on materials supplied by the Hawaii Department of Agriculture (HDOA). This new 643-Pest Hotline report form is designed to support HDOA efforts to manage phone-call-based public pest reports.

HDOA staff may use this new capability to divert all “non-investigative” public reports to the RAP system for curation. Once entered, these reports will be subjected to the same rule-based process as normal public reports submitted through the RAP system. This distributed work flow is intended to allow HDOA staff with limited time available to concentrate on the 643-Pest Hotline reports most important to the agency while still efficiently capturing and managing all Hotline reports.

643-Pest Hotline Support and Integration: Account for both “Investigative” (internal to HDOA) and “non-investigative” (sharable) scenarios.

The technical framework for the beta version accounts for both “Investigative and “Non-Investigative” scenarios. Investigative reports are those that are internal to HDOA, while non-investigative reports are those that are shareable with other agencies and possibly referred to other agencies for follow-up and response.

For more information, please contact: Sky Harrison (HBIN Project Manager) at skyh@hawaii.edu.

Appendix 1: Chapter 194, Hawaii Revised Statutes: INVASIVE SPECIES COUNCIL

Section

- 194-1 Definitions
- 194-2 Establishment of council; duties
- 194-3 Lead agencies; accountability
- 194-4 Relation of chapter to other laws
- 194-5 Entry; private property
- 194-6 Entry; public property
- 194-7 Rules

Cross References

Coqui frog; designation as pest, see §141-3.

Landowners liability for access to control invasive species, see chapter 520A.

Noxious weed control, see chapter 152.

Plant, animal, and microorganism, etc., imports, see chapter 150A.

[§194-1 Definitions.] As used in this [chapter], unless the context requires otherwise:

“Council” means the [invasive species council].

“Department” means any entity that is a member of the [invasive species council] established under section [194-2(a)]. [L 2003, c 85, §2; am L 2004, c 10, §16; am L 2006, c 109, §2].

[§194-2 Establishment of council; duties.] (a) There is established the invasive species council for the special purpose of providing policy level direction, coordination, and planning among state departments, federal agencies, and international and local initiatives for the control and eradication of harmful invasive species infestations throughout the State and for preventing the introduction of other invasive species that may be potentially harmful. The council shall:

(1) Maintain a broad overview of the invasive species problem in the State;

(2) Advise, consult, and coordinate invasive species-related efforts with and between the departments of agriculture, land and natural resources, health, and transportation, as well as state, federal, international, and privately organized programs and policies;

(3) Identify and prioritize each lead agency's organizational and resource shortfalls with respect to invasive species;

(4) After consulting with appropriate state agencies, create and implement a plan that includes the prevention, early detection, rapid response, control, enforcement, and education of the public with respect to invasive species, as well as fashion a mission statement articulating the State's position against invasive species; provided that the appropriate state agencies shall collaborate with the counties and communities to develop and implement a systematic approach to reduce and control coqui frog infestations on public lands

that are near or adjacent to communities, and shall provide annual reports on the progress made in achieving this objective;

(5) Coordinate and promote the State's position with respect to federal issues, including:

(A) Quarantine preemption;

(B) International trade agreements that ignore the problem of invasive species in Hawaii;

(C) First class mail inspection prohibition;

(D) Whether quarantine of domestic pests arriving from the mainland should be provided by the federal government;

(E) Coordinating efforts with federal agencies to maximize resources and reduce or eliminate system gaps and leaks, including deputizing the United States Department of Agriculture's plant protection and quarantine inspectors to enforce Hawaii's laws;

(F) Promoting the amendment of federal laws as necessary, including the Lacey Act Amendments of 1981, Title 16 United States Code sections 3371-3378; Public Law 97-79, and laws related to inspection of domestic airline passengers, baggage, and cargo; and

(G) Coordinating efforts and issues with the federal Invasive Species Council and its National Invasive Species Management Plan;

(6) Identify and record all invasive species present in the State;

(7) Designate the department of agriculture, health, or land and natural resources as the lead agency for each function of invasive species control, including prevention, rapid response, eradication, enforcement, and education;

(8) Identify all state, federal, and other moneys expended for the purposes of the invasive species problem in the State;

(9) Identify all federal and private funds available to the State to fight invasive species and advise and assist state departments to acquire these funds;

(10) Advise the governor and legislature on budgetary and other issues regarding invasive species;

(11) Provide annual reports on budgetary and other related issues to the legislature twenty days prior to each regular session;

(12) Include and coordinate with the counties in the fight against invasive species to increase resources and funding and to address county-sponsored activities that involve invasive species;

(13) Review state agency mandates and commercial interests that sometimes call for the maintenance of potentially destructive alien species as resources for sport hunting, aesthetic resources, or other values;

(14) Review the structure of fines and penalties to ensure maximum deterrence for invasive species-related crimes;

(15) Suggest appropriate legislation to improve the State's administration of invasive species programs and policies;

(16) Incorporate and expand upon the department of agriculture's weed risk assessment protocol to the extent appropriate for the council's invasive species control and eradication efforts; and

(17) Perform any other function necessary to effectuate the purposes of this chapter.

(b) The council shall be placed within the department of land and natural resources for administrative purposes only and shall be composed of:

(1) The president of the University of Hawaii, or the president's designated representative;

(2) The director, or the director's designated representative, of each of the following departments:

(A) Business, economic development, and tourism;

(B) Health; and

(C) Transportation; and

(3) The chairperson, or the chairperson's designated representative, of each of the following departments:

(A) Agriculture; and

(B) Land and natural resources.

(c) Representatives of federal agencies, the legislature, and members of the private sector shall be asked to participate or consulted for advice and assistance. Representatives of the legislature shall consist of eight members, as follows:

(1) Four senators, one from each county, to be selected by the senate president; and

(2) Four representatives, one from each county, to be selected by the speaker of the house of representatives.

(d) The council shall meet no less than twice annually to discuss and assess progress and recommend changes to the invasive species programs based on results of current risk assessments, performance standards, and other relevant data. Notwithstanding any law to the contrary:

(1) A simple majority of voting members of the council shall constitute a quorum to do business; and

(2) Any action taken by the council shall be by a simple majority of the voting members.

(e) The council shall submit a report of its activities to the governor and legislature annually. [L 2003, c 85, §3; am L 2004, c 10, §16; am L 2006, c 109, §§1, 2; am L 2008, c 160, §1]

[§194-3 Lead agencies; accountability.] A state department that is designated as a lead agency under section [194-2(a) (7)], with respect to a particular function of invasive species control, shall have sole administrative responsibility and accountability for that designated function of invasive species control. The lead agency shall:

(1) Coordinate all efforts between other departments and federal and private agencies to control or eradicate the designated invasive species;

(2) Prepare a biennial multi-departmental budget proposal for the legislature forty days before the convening of the regular session of the legislature in each odd-numbered year, showing the budget requirements of each of the lead agency's assigned invasive species function that includes the budget requirements of all departments that it leads for that species, as well as other federal and private funding for that invasive species;

(3) Prepare and distribute an annual progress report forty days prior to the convening of each regular session of the legislature to

the governor and the legislature that includes the status of each assigned function; and

(4) Any other function of a lead agency necessary to effectuate the purposes of this [chapter]. [L 2003, c 85, §4; am L 2004, c 10, §16; am L 2006, c 109, §2]

(C) Transportation; and

(3) The chairperson, or the chairperson's designated representative, of each of the following departments:

(A) Agriculture; and

(B) Land and Natural Resources.

(c) Representatives of federal agencies, the legislature, and members of the private sector shall be asked to participate or consulted for advice and assistance. Representatives of the legislature shall consist of eight members, as follows:

(1) Four senators, one from each county, to be selected by the Senate president; and

(2) Four representatives, one from each county, to be selected by the speaker of the House of Representatives.

(d) The Council shall meet no less than twice annually to discuss and assess progress and recommend changes to the invasive species programs based on results of current risk assessments, performance standards, and other relevant data. Notwithstanding any law to the contrary:

(1) A simple majority of voting members of the council shall constitute a quorum to do business; and

(2) Any action taken by the council shall be by a simple majority of the voting members.

(e) The Council shall submit a report of its activities to the governor and legislature annually. [L 2003, c 85, §3; am L 2004, c 10, §16; am L 2006, c 109, §§1, 2]

[\$194-4 Relation of chapter to other laws.] Notwithstanding any other law to the contrary, and in addition to any other authority provided by law that is not inconsistent with the purposes of this [chapter], a department is authorized to examine, control, and eradicate all instances of invasive species identified by the Council for control or eradication and found on any public or private premises or in any aircraft or vessel landed or docked in waters of the State. [L 2003, c 85, §5; am L 2004, c 10, §16; am L 2006, c 109, §2]

[\$194-5 Entry; private property.] (a) Whenever any invasive species identified by the Council for control or eradication is found on private property, a department may enter such premises to control or eradicate the invasive species after reasonable notice is given to the owner of the property and, if entry is refused, pursuant to the court order in subsection (d).

(b) If applicable, a duplicate of the notice so given shall be left with one or more of the tenants or occupants of the premises. If the premises are unoccupied, notice shall be mailed to the last known place of residence of the owner, if residing in the state. If the owner resides out of the state or cannot be expeditiously provided

with notice, notice left at the house or posted on the premises shall be sufficient.

(c) The department may instead cause notice to be given, and order the owner to control or eradicate the invasive species, if such species was intentionally and knowingly established by the owner on the owner's property and not naturally dispersed from neighboring properties, at the owner's expense within such reasonable time as the department may deem proper, pursuant to the notice requirements of this section.

(d) If the owner thus notified fails to comply with the order of the department, or its agent, within the time specified by the department, or if entry is refused after notice is given pursuant to subsection (a) and, if applicable subsection (b), the department or its agent may apply to the district court of the circuit in which the property is situated for a warrant, directed to any police officer of the circuit, commanding the police officer to take sufficient aid and to assist the department member or its agent in gaining entry onto the premises, and executing measures to control or eradicate the invasive species.

(e) The department may recover by appropriate proceedings the expenses incurred by its order from any owner who, after proper notice, has failed to comply with the department's order.

(f) In no case shall the department or any officer or agent thereof be liable for costs in any action or proceeding that may be commenced pursuant to this [chapter]. [L 2003, c 85, §6; am L 2004, c 10, §16; am L 2006, c 109, §2].

[\$194-6 Entry; public property.] (a) Whenever any invasive species is found on state or county property or on a public highway, street, lane, alley, or other public place controlled by the state or county, notice shall be given by the department or its agent, as the case may be, to the person officially in charge thereof, and the person shall be reasonably notified and ordered by the department to control or eradicate the invasive species.

(b) In case of a failure to comply with the order, the mode of procedure shall be the same as provided in case of private persons in section [194-5]. [L 2003, c 85, §7; am L 2004, c 10, §16; am L 2006, c 109, §2]

[\$194-7 Rules.] The invasive species council may adopt rules pursuant to chapter 91, to effectuate this [chapter]. [L 2003, c 85, §8; am L 2004, c 10, §16; am L 2006, c 109, §2] .